



**EAST WATERWAY OPERABLE UNIT
SUPPLEMENTAL REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
ADDENDUM TO THE FINAL DATA REPORT
FISH AND SHELLFISH TISSUE COLLECTION**

For submittal to:

**The US Environmental Protection Agency
Region 10
Seattle, WA**

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Acronyms

ACG	analytical concentration goal
BHC	benzene hexachloride
CAS	Columbia Analytical Services, Inc.
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
EPA	US Environmental Protection Agency
EW	East Waterway
HHRA	human health risk assessment
ID	identification
J	estimated concentration
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
MS/MSD	matrix spike/matrix spike duplicate
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RL	reporting limit
U	not detected at given concentration
ww	wet weight

1 Introduction

This addendum to the final data report for fish and shellfish tissue collection (Windward 2010b) presents the results of the additional pesticide analyses of fish, crab, mussel, geoduck, and clam tissue samples collected from August to October of 2008 as part of the supplemental remedial investigation for the East Waterway (EW). Sampling and analyses were conducted in accordance with the fish and shellfish quality assurance project plan (QAPP) (Windward 2008c) and the clam tissue QAPP (Windward 2008b). Stored fish and shellfish samples were re-analyzed by Columbia Analytical Services, Inc. (CAS), for pesticides using US Environmental Protection Agency (EPA) Method 1699M. Re-analysis was conducted because the reporting limits (RLs) for organochlorine pesticides in the initial analyses were above analytical concentration goals (ACGs) (Windward 2010b). These results will be used in place of the initial results for the assessment of risks associated with pesticides in tissues. Toxaphene, which was never detected in the original analysis and was not a target analyte for the re-analysis, will be assessed in the uncertainty sections of the human health risk assessment (HHRA) and the ecological risk assessment based on the results of the initial analysis.

2 Fish and Shellfish Tissue Collection and Sample Processing Methods

The tissue sampling was conducted throughout the EW in 2008. Fish, crab, shrimp, and mussel sampling was conducted from August to October. Rockfish were collected by scuba divers from August 11 to 13 and on October 24; crabs and shrimp were collected with the use of traps on August 26 and 27; fish were collected by trawling on September 2; and mussels were collected by hand on August 27. Although shrimp were collected, sufficient biomass was not available for additional pesticide analysis. More information on the fish and shellfish tissue collection and sample processing methods can be found in the fish and shellfish tissue collection data report (Windward 2010b) and in the fish and shellfish QAPP (Windward 2008c).

Intertidal clam tissue samples and co-located sediment samples were collected at low tide from the EW from July 29 to August 1, 2008, at nine intertidal locations identified as having intertidal clam habitat. Geoducks were collected in subtidal sediments by divers using a pressurized water nozzle that was inserted into the sediment adjacent to each geoduck. This hydraulic extraction method is similar to that used by commercial geoduck harvesters. More information on the intertidal clam and geoduck tissue collection and sample processing methods can be found in the clam tissue data report (Windward 2010a) and in the clam sampling QAPP (Windward 2008a). Homogenized tissue samples were stored frozen until analysis.

The individual and composite samples selected for re-analysis are described below. The samples selected for additional pesticide analysis are presented in Table 2-1.

Table 2-1. Samples selected for additional pesticide analysis

Matrix	Sample ID	Sample Selected?
Red rock crab and Dungeness crab – hepatopancreas	EW08-RRDC-HP-SUPCOMP3	1 replicate super-composite sample (edible meat) 1 replicate super-composite sample (hepatopancreas)
Red rock crab and Dungeness crab – edible meat	EW08-RRDC-EM-SUPCOMP3	
English sole – fillet	EW08-ES-FL-SUPCOMP1	1 replicate super-composite sample
English sole – whole body	EW08-ES-WB-SUPCOMP1	1 replicate super-composite sample
Shiner surfperch – whole body	EW08-SS-WB-SUPCOMP1	1 replicate super-composite sample
Mussel	EW08-MS-WB-SUPCOMP1	1 replicate super-composite sample
Brown rockfish	EW-08-SB002-BR-01	no (insufficient sample mass)
	EW-08-SB002-BR-02	no (insufficient sample mass)
	EW-08-SB002-BR-03	no (insufficient sample mass)
	EW-08-SB002-BR-04	yes
	EW-08-SB002-BR-05	yes
	EW-08-SB002-BR-06	yes
	EW-08-SB002-BR-07	yes
	EW-08-SB002-BR-08	yes
	EW-08-SB002-BR-09	yes
	EW-08-SB002-BR-10	yes
	EW-08-SB002-BR-11	yes
	EW-08-SB002-BR-12	no (insufficient sample mass)
	EW-08-SB002-BR-13	yes
Butter clam	EW-B03-BC-03-COMP01	yes
	EW-B06-BC-01-COMP01	no
	EW-B06-BC-01-COMP02	yes
	EW-B08-BC-01-COMP01	no
	EW-B08-BC-01-COMP02	yes
	EW-B10-BC-01-COMP01	no
	EW-B10-BC-01-COMP02	yes
Littleneck clam	EW-B08-NL-03-COMP01	no (insufficient sample mass)
Cockles	EW-B08-CN-02-COMP01	yes
	EW-B10-CN-05-COMP01	yes
Softshell clam	EW-B09-NY-M-COMP01	yes

Matrix	Sample ID	Sample Selected?
Shrimp	EW-SR-WB-COMP01	no (insufficient sample mass)
Geoduck – edible meat	EW-S01-GD01	One composite sample was created
	EW-S01-GD02	
	EW-S01-GD03	
	EW-S01-GD04	
	EW-S01-GD07	
	EW-S01-GD10	
Geoduck – gutball	EW-S01-GD-GBCOMP1	yes
	EW-S01-GD-GBCOMP2	no (insufficient sample mass)
	EW-S01-GD-GBCOMP3	no (insufficient sample mass)

ID – identification

2.1 FISH AND CRAB COMPOSITE SAMPLES

All fish and crab super-composite samples with sufficient remaining sample mass were submitted for the additional pesticide analysis by high-resolution gas chromatography/tandem mass spectrometry (EPA Method 1699M) at CAS. These samples were created by combining the original composites in order to create samples that represented greater numbers of fish. Rockfish were analyzed as individual fish and clam composites were analyzed for each collection location. Geoducks were originally analyzed as individuals and were combined into one composite sample for the additional pesticide analysis.

The results of the original analysis of the super-composite samples for polychlorinated biphenyl congeners and dioxins and furans indicated very little variance between the replicate super-composites. The average standard deviation on the mean total PCB concentration was ten percent of the mean total PCB concentration and the average standard deviation on the mean TEQ concentration was nine percent of the mean TEQ concentration. Therefore, one super-composite sample was selected for each tissue matrix for the pesticide re-analysis, as proposed in the pesticide reanalysis memorandum (Attachment 1).

2.2 CLAM AND GEODUCK SAMPLES

One butter clam sample from each of the intertidal beach areas was selected for the additional pesticide analysis using EPA Method 1699M at CAS. In addition, two cockle samples were selected for analysis. The six remaining geoduck edible meat samples were combined to create one composite sample for geoduck tissue. Finally, one gutball tissue sample had sufficient mass remaining for this analysis. All of the selected clam and geoduck tissue samples are identified in Table 2-1.

2.3 MUSSEL SAMPLES

One super-composite sample was created for the additional pesticide analysis using EPA Method 1699M at CAS, and represented all 11 existing mussel composite samples. This composite represented 1,075 mussels collected from locations throughout the EW. The original analysis of the mussel composites indicated that mussel tissue concentrations are consistent throughout EW for a wide range of organic chemicals and metals (Windward 2009), which is consistent with the mussel data for the Lower Duwamish Waterway. The analysis of a super-composite sample for pesticides resulted in a value that can be used to assess exposure of humans and wildlife resulting from the consumption of mussel tissue from throughout the EW.

3 Analytical Methods

Fish and shellfish tissue samples were analyzed for pesticides using EPA Method 1699M at CAS. There were no analytical deviations from the analytical approach proposed in the pesticide re-analysis memorandum (Attachment 1).

4 Results of Chemical Analyses

This section presents results of the chemical analysis and data validation of the fish and shellfish tissue samples selected for additional pesticide analysis. The complete data are provided in Attachment 2. The laboratory data forms are provided in Attachment 3.

The quality assurance review of the chemistry data was conducted in accordance with the quality assurance/quality control (QA/QC) requirements and technical specifications of the methods and the national functional guidelines for organic and inorganic data review (EPA 1999, 2002, 2004). EcoChem, Inc., conducted the data review and full validation. The results of the data validation are summarized in Section 4.2. The data validation report is provided in Attachment 4.

4.1 TISSUE CHEMISTRY RESULTS

This section presents the analytical chemistry results for pesticides for all tissue types. Attachment 2 presents a complete list of chemical concentrations per sample. A summary of chemistry results for brown rockfish, English sole, red rock crab, and Dungeness crab, and shiner surfperch are presented in Table 4-1. The summary includes the number of detections, the range of detected concentrations, and the range of RLs.

The range of expected RLs was 0.10-0.50 µg/kg dw tissue were lower than the reported RLs which ranged from 0.41-2.4 µg/kg dw tissue. The reported RLs are affected by sample dilutions and instrument performance at the time of analysis. The reported RLs were more sensitive than the RLs associated with the original analysis by EPA Method 8081 which ranged from 4.6-99 µg/kg dw tissue.

2,4'-Dichlorodiphenyldichloroethane (DDD) was detected in English sole and shiner surfperch tissue. 4,4'-DDD, 4,4'-dichlorodiphenyldichloroethylene (DDE), alpha- and beta-chlordane, and cis- and trans-nonachlor were detected in brown rockfish, English sole, red rock crab, and Dungeness crab hepatopancreas, and shiner surfperch tissue. 4,4'-Dichlorodiphenyltrichloroethane (DDT) was detected in brown rockfish and shiner surfperch tissue. Dieldrin was detected in brown rockfish, English sole, and shiner surfperch tissue. Alpha-benzene hexachloride (BHC) and mirex were detected in brown rockfish tissue. Beta-endosulfan was detected in brown rockfish and English sole tissue. Heptachlor epoxide was detected in brown rockfish and crab hepatopancreas tissue. Oxychlordane was detected in crab hepatopancreas tissue. Hexachlorobenzene was detected in brown rockfish and crab hepatopancreas tissue.

Table 4-1. Summary of organochlorine pesticides in fish and shellfish composite tissue samples and brown rockfish individual tissue samples

Species by Chemical	Detection Frequency	Detected Concentration ($\mu\text{g}/\text{kg}$ ww)		Reporting Limits ($\mu\text{g}/\text{kg}$ ww)
		Minimum	Maximum	
2,4'-DDD				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	1/1	0.66 J	0.66 J	na
English sole – whole body	1/1	0.83 J	0.83 J	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	1/1	0.52 J	0.52 J	na
2,4'-DDE				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
2,4'-DDT				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
4,4'-DDD				
Brown rockfish – whole body	9/9	0.98	5.6	na
English sole – fillet with skin	1/1	4.4	4.4	na

Species by Chemical	Detection Frequency	Detected Concentration ($\mu\text{g}/\text{kg}$ ww)		Reporting Limits ($\mu\text{g}/\text{kg}$ ww)
		Minimum	Maximum	
English sole – whole body	1/1	5.4	5.4	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	1/1	0.33 J	0.33 J	na
Shiner surfperch – whole body	1/1	2.5	2.5	na
4,4'-DDE				
Brown rockfish – whole body	9/9	7.0 J	49 J	na
English sole – fillet with skin	1/1	7.6 J	7.6 J	na
English sole – whole body	1/1	9.3 J	9.3 J	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	2.1
Red rock and Dungeness crab – hepatopancreas	1/1	6.9 J	6.9 J	na
Shiner surfperch – whole body	1/1	7.1 J	7.1 J	na
4,4'-DDT				
Brown rockfish – whole body	9/9	0.50 J	1.4	na
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	1/1	0.62 J	0.62 J	na
Total DDTs				
Brown rockfish – whole body	9/9	8.5 J	54 J	na
English sole – fillet with skin	1/1	12.7 J	12.7 J	na
English sole – whole body	1/1	15.5 J	15.5 J	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	2.1
Red rock and Dungeness crab – hepatopancreas	1/1	7.2 J	7.2 J	na
Shiner surfperch – whole body	1/1	10.7 J	10.7 J	na
Aldrin				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
Dieldrin				
Brown rockfish – whole body	8/9	0.24 J	0.66 J	0.94
English sole – fillet with skin	1/1	0.28 J	0.28 J	na
English sole – whole body	1/1	0.39 J	0.39 J	na

Species by Chemical	Detection Frequency	Detected Concentration (µg/kg ww)		Reporting Limits (µg/kg ww)
		Minimum	Maximum	
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	1/1	0.76 J	0.76 J	na
Total Aldrin/Dieldrin				
Brown rockfish – whole body	8/9	0.24 J	0.66 J	0.94
English sole – fillet with skin	1/1	0.28 J	0.28 J	na
English sole – whole body	1/1	0.39 J	0.39 J	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	1/1	0.76 J	0.76 J	na
alpha-BHC				
Brown rockfish – whole body	2/9	0.31 J	0.58 J	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
beta-BHC				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
gamma-BHC				
Brown rockfish – whole body	0/9	nd	nd	0.41 – 0.47
English sole – fillet with skin	0/1	nd	nd	0.44
English sole – whole body	0/1	nd	nd	0.46
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.47
Shiner surfperch – whole body	0/1	nd	nd	0.43
delta-BHC				
Brown rockfish – whole body	0/3	nd	nd	0.89 – 0.94
alpha-Chlordane				
Brown rockfish – whole body	9/9	0.51	1.4	na
English sole – fillet with skin	1/1	0.71	0.71	na

Species by Chemical	Detection Frequency	Detected Concentration ($\mu\text{g}/\text{kg}$ ww)		Reporting Limits ($\mu\text{g}/\text{kg}$ ww)
		Minimum	Maximum	
English sole – whole body	1/1	0.91	0.91	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.47
Shiner surfperch – whole body	1/1	0.84	0.84	na
beta-Chlordane				
Brown rockfish – whole body	9/9	0.36 J	0.79	na
English sole – fillet with skin	1/1	0.39 J	0.39 J	na
English sole – whole body	1/1	0.50	0.50	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.47
Shiner surfperch – whole body	1/1	0.57 J	0.57 J	na
Total Chlordane				
Brown rockfish – whole body	9/9	2.8 J	13.7 J	na
English sole – Fillet with skin	1/1	2.55 J	2.55 J	na
English sole – whole body	1/1	3.2 J	3.2 J	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	2.1
Red rock and Dungeness crab – hepatopancreas	1/1	42 J	42 J	na
Shiner surfperch – whole body	1/1	3.0 J	3.0 J	na
Chlorpyrifos				
Brown rockfish – whole body	0/9	nd	nd	0.41 – 0.47
English sole – fillet with skin	0/1	nd	nd	0.44
English sole – whole body	0/1	nd	nd	0.46
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.47
Shiner surfperch – whole body	0/1	nd	nd	0.43
alpha-Endosulfan				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
beta-Endosulfan				
Brown rockfish – whole body	6/9	1.2 J	13 J	0.89 – 0.94
English sole – fillet with skin	1/1	1.0 J	1.0 J	na
English sole – whole body	1/1	1.8 J	1.8 J	na

Species by Chemical	Detection Frequency	Detected Concentration (µg/kg ww)		Reporting Limits (µg/kg ww)
		Minimum	Maximum	
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
Endosulfan Sulfate				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
Endrin				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
Endrin Aldehyde				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
Endrin Ketone				
Brown rockfish – whole body	0/9	nd	nd	0.41 – 0.47
English sole – fillet with skin	0/1	nd	nd	0.44
English sole – whole body	0/1	nd	nd	0.46
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.47
Shiner surfperch – whole body	0/1	nd	nd	0.43
Heptachlor				
Brown rockfish – whole body	0/9	nd	nd	0.41 – 0.47
English sole – fillet with skin	0/1	nd	nd	0.44
English sole – whole body	0/1	nd	nd	0.46
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42

Species by Chemical	Detection Frequency	Detected Concentration (µg/kg ww)		Reporting Limits (µg/kg ww)
		Minimum	Maximum	
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.47
Shiner surfperch – whole body	0/1	nd	nd	0.43
Heptachlor Epoxide				
Brown rockfish – whole body	1/9	0.14 J	0.14 J	0.41 – 0.47
English sole – fillet with skin	0/1	nd	nd	0.44
English sole – whole body	0/1	nd	nd	0.46
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	1/1	0.14 J	0.14 J	na
Shiner surfperch – whole body	0/1	nd	nd	0.43
Isodrin				
Brown rockfish – whole body	0/9	nd	nd	0.82 – 0.94
English sole – fillet with skin	0/1	nd	nd	0.88
English sole – whole body	0/1	nd	nd	0.92
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.83
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.93
Shiner surfperch – whole body	0/1	nd	nd	0.86
Methoxychlor				
Brown rockfish – whole body	0/9	nd	nd	0.41 – 0.47
English sole – fillet with skin	0/1	nd	nd	0.44
English sole – whole body	0/1	nd	nd	0.46
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.47
Shiner surfperch – whole body	0/1	nd	nd	0.43
Mirex				
Brown rockfish – whole body	9/9	0.16 J	0.76 J	na
English sole – fillet with skin	0/1	nd	nd	0.44
English sole – whole body	0/1	nd	nd	0.46
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.47
Shiner surfperch – whole body	0/1	nd	nd	0.43
cis-Nonachlor				
Brown rockfish – whole body	9/9	0.51 J	2.8 J	na
English sole – fillet with skin	1/1	0.46 J	0.46 J	na
English sole – whole body	1/1	0.51 J	0.51 J	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	1/1	0.18 J	0.18 J	na

Species by Chemical	Detection Frequency	Detected Concentration ($\mu\text{g}/\text{kg}$ ww)		Reporting Limits ($\mu\text{g}/\text{kg}$ ww)
		Minimum	Maximum	
Shiner surfperch – whole body	1/1	0.40 J	0.40 J	na
trans-Nonachlor				
Brown rockfish – whole body	9/9	1.4 J	9.0 J	na
English sole – fillet with skin	1/1	0.99 J	0.99 J	na
English sole – whole body	1/1	1.3 J	1.3 J	na
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	1/1	0.62 J	0.62 J	na
Shiner surfperch – whole body	1/1	1.2 J	1.2 J	na
Octachlorostyrene				
Brown rockfish – whole body	0/9	nd	nd	0.41 – 0.47
English sole – fillet with skin	0/1	nd	nd	0.44
English sole – whole body	0/1	nd	nd	0.46
Red rock and Dungeness crab – edible meat	0/1	nd	nd	0.42
Red rock and Dungeness crab – hepatopancreas	0/1	nd	nd	0.47
Shiner surfperch – whole body	0/1	nd	nd	0.43
Oxychlordane				
Brown rockfish – whole body	0/9	nd	nd	2.1 – 2.4
English sole – fillet with skin	0/1	nd	nd	2.2
English sole – whole body	0/1	nd	nd	2.3
Red rock and Dungeness crab – edible meat	0/1	nd	nd	2.1
Red rock and Dungeness crab – hepatopancreas	1/1	41 J	41 J	na
Shiner surfperch – whole body	0/1	nd	nd	2.2
Hexachlorobenzene				
Brown rockfish – whole body	4/9	0.74 J	1.7 J	2.1 – 2.4
English sole – fillet with skin	0/1	nd	nd	2.2
English sole – whole body	0/1	nd	nd	2.3
Red rock and Dungeness crab – edible meat	0/1	nd	nd	2.1
Red rock and Dungeness crab – hepatopancreas	1/1	1.1 J	1.1 J	na
Shiner surfperch – whole body	0/1	nd	nd	2.2

BHC – benzene hexachloride

J – estimated concentration

DDD – dichlorodiphenyl dichloroethane

nd – not detected

DDE – dichlorodiphenyl dichloroethylene

ww – wet weight

DDT – dichlorodiphenyl trichloroethane

A summary of chemistry results for butter clam, cockle, softshell clam, geoduck, and mussel are presented in Table 4-2. The summary includes the number of detections, the range of detected concentrations, and the range of RLs. 4,4'-DDD was detected in butter

clam, softshell clam, geoduck gutball, and mussel tissue. Alpha-, beta-, and gamma-BHC were all detected in geoduck edible-meat tissue. Alpha- and beta-chlordane were detected in butter clam tissue. Heptachlor and mirex were detected in mussel tissue. Trans-nonachlor was detected in butter clam and mussel tissue. Hexachlorobenzene was detected in butter clam, cockle, and softshell clam tissue.

Table 4-2. Summary of organochlorine pesticides in mussel, clam, and geoduck tissue samples

Species by Chemical	Detection Frequency	Detected Concentration ($\mu\text{g}/\text{kg}$ ww)		Reporting Limits ($\mu\text{g}/\text{kg}$ ww)
		Minimum	Maximum	
2,4'-DDD				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Eastern softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
2,4'-DDE				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Eastern softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
2,4'-DDT				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Eastern softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
4,4'-DDD				
Butter clam – whole body	2/4	0.48 J	0.55 J	0.82 – 0.85
Cockle – whole body	0/1	nd	nd	0.85
Eastern softshell clam – whole body	1/1	0.16 J	0.16 J	na
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	1/1	0.27 J	0.27 J	na
Mussel – whole body	1/1	0.17 J	0.17 J	na

Species by Chemical	Detection Frequency	Detected Concentration (µg/kg ww)		Reporting Limits (µg/kg ww)
		Minimum	Maximum	
4,4'-DDE				
Butter clam – whole body	0/4	nd	nd	2.1 – 2.2
Cockle – whole body	0/1	nd	nd	2.2
Eastern softshell clam – whole body	0/1	nd	nd	2.2
Geoduck – edible meat	0/1	nd	nd	2.2
Geoduck – gutball	0/1	nd	nd	2.2
Mussel – whole body	0/1	nd	nd	2.4
4,4'-DDT				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Eastern softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
Total DDTs				
Butter clam – whole body	2/4	0.48 J	0.55 J	2.1 – 2.2
Cockle – whole body	0/1	nd	nd	2.2
Eastern softshell clam – whole body	1/1	0.16 J	0.16 J	na
Geoduck – edible meat	0/1	nd	nd	2.2
Geoduck – gutball	1/1	0.27 J	0.27 J	na
Mussel – whole body	1/1	0.17 J	0.17 J	na
Aldrin				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Eastern softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
Dieldrin				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Eastern softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94

Species by Chemical	Detection Frequency	Detected Concentration ($\mu\text{g/kg}$ ww)		Reporting Limits ($\mu\text{g/kg}$ ww)
		Minimum	Maximum	
Total Aldrin/Dieldrin				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Eastern softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
alpha-BHC				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	1/1	1.2 J	1.2 J	na
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
beta-BHC				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	1/1	1.5 J	1.5 J	na
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
gamma-BHC				
Butter clam – whole body	0/4	nd	nd	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	1/1	0.18 J	0.18 J	na
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	0/1	nd	nd	0.47
delta-BHC				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Softshell clam – whole body	0/1	nd	nd	0.87
alpha-Chlordane				
Butter clam – whole body	1/4	0.25 J	0.25 J	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44

Species by Chemical	Detection Frequency	Detected Concentration (µg/kg ww)		Reporting Limits (µg/kg ww)
		Minimum	Maximum	
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	0/1	nd	nd	0.47
beta-Chlordane				
Butter clam – whole body	2/4	0.14 J	0.28 J	0.43 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	0/1	nd	nd	0.47
Total Chlordane				
Butter clam – whole body	2/4	0.25 J	0.68 J	2.2
Cockle – whole body	0/1	nd	nd	2.2
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	2.2
Geoduck – gutball	0/1	nd	nd	2.2
Mussel – whole body	1/1	0.11 J	0.11 J	na
Chlorpyrifos				
Butter clam – whole body	0/4	nd	nd	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	0/1	nd	nd	0.47
alpha-Endosulfan				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
beta-Endosulfan				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87

Species by Chemical	Detection Frequency	Detected Concentration (µg/kg ww)		Reporting Limits (µg/kg ww)
		Minimum	Maximum	
Mussel – whole body	0/1	nd	nd	0.94
Endosulfan Sulfate				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
Endrin				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
Endrin Aldehyde				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
Endrin Ketone				
Butter clam – whole body	0/4	nd	nd	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	0/1	nd	nd	0.47
Heptachlor				
Butter clam – whole body	0/4	nd	nd	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	1/1	0.10 J	0.10 J	na

Species by Chemical	Detection Frequency	Detected Concentration (µg/kg ww)		Reporting Limits (µg/kg ww)
		Minimum	Maximum	
Heptachlor Epoxide				
Butter clam – whole body	0/4	nd	nd	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	0/1	nd	nd	0.47
Isodrin				
Butter clam – whole body	0/4	nd	nd	0.82 – 0.87
Cockle – whole body	0/1	nd	nd	0.85
Softshell clam – whole body	0/1	nd	nd	0.87
Geoduck – edible meat	0/1	nd	nd	0.88
Geoduck – gutball	0/1	nd	nd	0.87
Mussel – whole body	0/1	nd	nd	0.94
Methoxychlor				
Butter clam – whole body	0/4	nd	nd	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	0/1	nd	nd	0.47
Mirex				
Butter clam – whole body	0/4	nd	nd	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	1/1	0.11 J	0.11 J	na
cis-Nonachlor				
Butter clam – whole body	0/4	nd	nd	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	0/1	nd	nd	0.47

Species by Chemical	Detection Frequency	Detected Concentration (µg/kg ww)		Reporting Limits (µg/kg ww)
		Minimum	Maximum	
trans-Nonachlor				
Butter clam – whole body	2/4	0.11 J	0.15 J	0.43 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	1/1	0.11 J	0.11 J	na
Octachlorostyrene				
Butter clam – whole body	0/4	nd	nd	0.41 – 0.44
Cockle – whole body	0/1	nd	nd	0.43
Softshell clam – whole body	0/1	nd	nd	0.44
Geoduck – edible meat	0/1	nd	nd	0.44
Geoduck – gutball	0/1	nd	nd	0.44
Mussel – whole body	0/1	nd	nd	0.47
Oxychlordane				
Butter clam – whole body	0/4	nd	nd	2.1 – 2.2
Cockle – whole body	0/1	nd	nd	2.2
Geoduck – edible meat	0/1	nd	nd	2.2
Geoduck – gutball	0/1	nd	nd	2.2
Mussel – whole body	0/1	nd	nd	2.4
Hexachlorobenzene				
Butter clam – whole body	2/4	0.77 J	0.77 J	2.1 – 2.2
Cockle – whole body	1/1	1.4 J	1.4 J	na
Softshell clam – whole body	1/1	1.5 J	1.5 J	na
Geoduck – edible meat	0/1	nd	nd	2.2
Geoduck – gutball	0/1	nd	nd	2.2
Mussel – whole body	0/1	nd	nd	2.4

BHC – benzene hexachloride

J – estimated concentration

DDD – dichlorodiphenylchloroethane

nd – not detected

DDE – dichlorodiphenylchloroethylene

ww – wet weight

DDT – dichlorodiphenyltrichloroethane

4.2 COMPARISON OF NON-DETECTED RESULTS WITH ANALYTICAL CONCENTRATION GOALS

The RLs that were obtained for the initial analysis as well as the RLs for the re-analysis that was conducted by CAS using EPA Method 1699M are compared with the tissue ACGs for pesticides in Table 4-3. The re-analysis RLs are consistently lower than the

original RLs. The RLs for 10 pesticides from the re-analysis are greater than the fish tissue ACGs (Table 4-3). The effects of RLs on the risk characterization will be addressed in the uncertainty section of the HHRA.

Table 4-3. Comparison of reporting limits and ACGs

Pesticide	Original RL (mg/kg ww) ^a	Re-Analysis RL (mg/kg ww) ^b	Fish Tissue ACG (mg/kg ww)	Receptor Exposure with ACG Lower than Reported RL
alpha-BHC	0.0046 – 0.0099	0.00082 – 0.00094	0.00013	yes – human consumption
gamma-BHC	0.0046 – 0.0099	0.00041 – 0.00047	0.00062	
beta-BHC	0.0046 – 0.0099	0.00082 – 0.00094	0.00045	yes – human consumption
delta-BHC	0.0046 – 0.0099	0.00082 – 0.00094	0.00013	yes – human consumption
Hexachlorobenzene	0.0046–0.330	0.0021 – 0.0024	0.0005	yes – human consumption
Heptachlor	0.0046 – 0.0099	0.00041 – 0.00047	0.00018	yes – human consumption
Dieldrin	0.0091 – 0.069	0.00082 – 0.00094	5.0 x 10⁻⁵	yes – human consumption
Aldrin	0.0046 – 0.0099	0.00082 – 0.00094	4.8 x 10⁻⁵	yes – human consumption
Oxychlordane	0.0091 – 0.021	0.0021 – 0.0024	0.0023	yes – human consumption
Heptachlor epoxide	0.0046 – 0.043	0.00041 – 0.00047	8.9 x 10⁻⁵	yes – human consumption
4,4'-DDE	0.0091 – 0.010	0.0021 – 0.0024	0.0024	
4,4'-DDD	0.0091 – 0.020	0.00082 – 0.00088	0.0024	
4,4'-DDT	0.0091 – 0.500	0.00082 – 0.00094	0.0024	
alpha Chlordanne	0.0046 – 0.0099	0.00041 – 0.00047	0.0023	
trans-Nonachlor	0.0091 – 0.034	0.00042 – 0.00044	0.0023	
Endosulfan	0.0046 – 0.074	0.00082 – 0.00094	0.00062	yes – human consumption
cis-Nonachlor	0.0091 – 0.097	0.00041 – 0.00047	na	
Endrin	0.0091 – 0.099	0.00082 – 0.00094	0.025	
Endosulfan sulfate	0.0091 – 0.020	0.00082 – 0.00094	na	
Methoxychlor	0.046 – 0.099	0.00041 – 0.00047	0.015	
Mirex	0.0091 – 0.020	0.00041 – 0.00047	0.017	

Source: Windward (2008c), Appendix C

^a RLs from initial analysis using EPA Method 8081A.

^b RLs from re-analysis using EPA Method 1699M.

ACG – analytical concentration goal

EPA – US Environmental Protection Agency

BHC – benzene hexachloride

MDL – method detection limit

DDD – dichlorodiphenyldichloroethane

RL – reporting limit

DDE – dichlorodiphenyldichloroethylene

ww – wet weight

DDT – dichlorodiphenyltrichloroethane

Bold identifies RLs that exceed the ACG.

Table 4-4. Number of re-analysis RLs and MDLs above the ACGs for tissue samples

Pesticide	Unit	No. of Detected Results	Range of Detected Results	No. of Non-Detected Results	Range of RLs for Non-Detected Results	No. of RLs > ACG	Range of MDLs for Non-Detected Results	No. of MDLs > ACG	Target RL	ACG ^a
alpha-BHC	µg/kg ww	3	0.31J – 1.2J	20	0.82 – 0.94	20	0.26	20	0.1	0.13
beta-BHC	µg/kg ww	1	1.5J	22	0.82 – 0.94	22	0.40	0	0.1	0.45
delta-BHC	µg/kg ww	0	nd	9 ^b	0.82 – 0.87	9	0.28	9	0.1	0.13
Hexachlorobenzene	µg/kg ww	8	0.74J – 1.7J	15	2.1 – 2.4	15	0.70	15	0.1	0.5
Heptachlor	µg/kg ww	1	0.10J	22	0.41 – 0.47	22	0.09	22	0.1	0.18
Dieldrin	µg/kg ww	11	0.24J – 0.76J	12	0.82 – 0.94	12	0.22	12	0.5	0.05
Aldrin	µg/kg ww	0	nd	23	0.82 – 0.94	23	0.22	23	0.1	0.048
Oxychlordane	µg/kg ww	1	41J	21 ^c	2.1 – 2.4	5	0.77	5	0.5	2.3
Heptachlor epoxide	µg/kg ww	2	0.14J	21	0.41 – 0.47	21	0.061	21	0.1	0.089
alpha-Endosulfan	µg/kg ww	0	nd	22 ^c	0.82 – 0.94	22	0.42	0	0.2	0.62
beta-Endosulfan	µg/kg ww	9	1.0J – 13J	14	0.82 – 0.94	14	0.35	0	0.2	0.62

^a Tissue ACGs are from Appendix C of the fish and shellfish QAPP (Windward 2008c).

^b Total sample number was reduced because of the rejection of results associated with low recoveries in the laboratory control samples.

^c Total sample number was reduced because of the rejection of results associated with low recoveries in the MS/MSD.

ACG – analytical concentration goal

QAPP – quality assurance project plan

BHC – benzene hexachloride

RL – reporting limit

MDL – method detection limit

nd – not detected

MS – matrix

ww – wet weight

MSD – matrix spike duplicate

4.3 DATA VALIDATION RESULTS

The complete data validation report is provided in Attachment 4. In general, the data met all the QA requirements. Tissue samples were held frozen for 18-20 months prior to the pesticide re-analysis. EPA QA office was consulted prior to analysis and approved the use of the data for the EW ERA and HHRA despite the fact that the analysis was conducted outside of the one-year holding time for these analytes. All detected and nondetected results were qualified as estimated (J and UJ qualification) due to the analysis of the samples outside of holding times.

Oxychlordane, alpha-endosulfan, and endrin aldehyde were not recovered from one matrix spike/matrix spike duplicate (MS/MSD), and the non-detected results for that sample (EW-B09-MY-M-Comp1) were rejected. In addition, the recovery of delta-BHC for a laboratory control sample/laboratory control sample duplicate (LCS/LCSD) sample was less than the lower control limit and less than 10%. The RLs were rejected in all associated samples.

Results were qualified as estimated as a result of the fact that LCS recovery values were above the upper control limits for beta-BHC, hexachlorobenzene, 2,4'-DDE, 4,4'-DDE, 2,4'-DDD, and 2,4'-DDT. Results were also qualified as estimated because LCS recovery values were below the lower control limit for endrin aldehyde and endosulfan sulfate. Attachment 4 contains a detailed discussion of all data validation qualifiers and the affected samples.

5 References

- EPA. 1999. USEPA contract laboratory program national functional guidelines for organic data review. EPA-540/R-99/008. Office of Emergency and Remedial Response, US Environmental Protection Agency, Washington, DC.
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- Windward. 2008a. Quality assurance project plan: benthic invertebrate tissue/gastropod collection. East Waterway Operable Unit supplemental remedial investigation/feasibility study. Windward Environmental LLC, Seattle, WA.
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Windward. 2010b. Data report: fish and shellfish tissue collection. Final. East Waterway Operable Unit supplemental remedial investigation/feasibility study. Windward Environmental LLC, Seattle, WA.

MEMORANDUM

To: Ravi Sanga, USEPA
From: Susan McGroddy and Nancy Judd, Windward LLC on behalf of the Port of Seattle
Subject: Estimated risk associated with pesticide tissue concentrations
Date: November 6, 2009

In order to determine whether or not additional analysis of tissue samples for pesticides is warranted, preliminary estimates of the human health risks associated with pesticide concentrations in fish, crab, clam and geoduck tissues were developed. There is uncertainty associated with the results of the pesticide analysis of the EW tissue samples due to the presence of PCB congeners in the samples. Analytical interference due to the presence of PCB congeners results in high bias for the detected pesticide concentrations as well as elevated reporting limits associated with nondetected results. The preliminary estimates of risk associated with these results were developed to determine whether or not the existing data results in unacceptably high risk estimates that require further analysis.

The only pesticides detected in tissues from EW were dieldrin, total DDTs, and cis-nonachlor. Dieldrin was detected in rockfish and shiner surfperch samples, and DDTs were detected in rockfish, crab, perch, and English sole samples. Cis-nonachlor was the only detected component of total chlordane, and it was only detected in one sample (red rock crab hepatopancreas).

A few preliminary risk estimates, using the higher of the maximum detected concentration or $\frac{1}{2}$ the maximum reporting limit (RL) as the EPCs for each seafood category and the exposure assumptions for the adult tribal RME (Tulalip data) scenario presented in the human health technical memo were developed. The EW excess cancer risk estimates were 4E-6 for total DDTs and 1E-4 for dieldrin. The risk estimates for the LDW for this scenario were 2E-5 for total DDTs and 1E-4 for dieldrin. A risk estimate for total chlordane for EW was not calculated but would be expected to be lower than that estimated for the LDW (6E-6) because detections were few for both Waterways and reporting limits for chlordanes for EWW were generally lower than those for the LDW.

There are fifteen other (undetected) pesticides for which toxicological data appropriate for risk assessment are available. Of these, six (mirex, methoxychlor, endrin ketone, endosulfan sulfate, alpha-endosulfan, and beta endosulfan) have maximum RLs below the risk based screening levels (RBCs) as described in the human health technical memo and would not be considered contaminants of potential concern (COPCs). The remaining nine (aldrin, alpha-BHC, beta-BHC, gamma-BHC, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, and toxaphene) have RLs exceeding the RBCs and will therefore be designated as COPCs for EW. These nine chemical were evaluated quantitatively in the LDW HHRA (in the risk characterization if they were ever detected and hypothetically in the uncertainty assessment if they were never

detected). A comparison of EW RLs and the concentrations from the LDW can be used to develop a crude estimate what risk estimates based on the EW RLs might be. None of these chemicals with non-cancer endpoints had hazard quotients (HQs) greater than 0.2 for the LDW for the adult Tribal RME (Tulalip data), and hypothetical EW non-cancer HQs would be expected to be well below 1 for EW for the same scenario. Carcinogenic risks for the adult tribal RME(Tulalip data) scenario for the LDW were as follows: toxaphene (5E-4), aldrin (4e-5), alpha-BHC(2E-5), beta-BHC (6E-6), and gamma-BHC(3E-6). Hypothetical excess cancer risk estimates (based on RLs) for the same scenario for EW would be expected to be similar for these chemicals.

The results are summarized in Table 1. Further analysis would result in reduced reporting limits for all the pesticides with the exception of toxaphene. Toxaphene is a complex mixture and is difficult to analyze. The proposed method developed by Columbia Analytical Services does not include Toxaphene as an analyte.

Table 1. Summary of preliminary pesticide evaluation

Chemical	Detected?	Above Screening Value?	Hazard Quotients	Carcinogenic Risks	More sensitive analysis possible?
Total DDTs	Yes	Yes	0.02	4×10^{-6}	yes
Dieldrin	Yes	Yes	0.15	1×10^{-4}	yes
Total Chlordane	Yes ^a	Yes	ne	ne	yes
Mirex	No	No	ne	ne	yes
Methoxychlor	No	No	ne	ne	yes
Endrin Ketone	No	No	ne	ne	yes
Endrin sulfate	No	No	ne	ne	yes
alpha endosulfan	No	No	ne	ne	yes
beta endosulfan	No	No	ne	ne	yes
Aldrin	No	Yes	0.09 ^b	4×10^{-5} ^b	yes
alpha BHC	No	Yes	0.005 ^b	2×10^{-5} ^b	yes
beta BHC	No	Yes	0.02 ^b	6×10^{-6} ^b	yes
gamma BHC (lindane)	No	Yes	0.01 ^b	3×10^{-6} ^b	yes
Endrin	No	Yes	0.01 ^b	ne	yes
Endrin aldehyde	No	Yes	0.02 ^b	ne	yes
Heptachlor	No	Yes	0.005 ^b	ne	yes
Heptachlor epoxide	No	Yes	0.2 ^b	ne	yes
Toxaphene	No	Yes	ne	5×10^{-4} ^b	no ^c

ne – not evaluated

^a One component of total chlordane (cis-nonachlor) was detected in one sample.

^b EW RLs were similar to the LDW RL values and the estimate risk is the result from the LDW analysis.

^cToxaphene has not been developed as an analyte for the MS/MS analysis due to the difficulties associated with analyzing complex mixtures such as toxaphene.

Attachment 2

Table 1. Organochlorine pesticide results from brown rockfish individual tissue samples

Chemical	Concentration(µg/kg ww)								
	Brown Rockfish – Whole Body								
	EW-08-SB004-BR-04	EW-08-SB005-BR-05	EW-08-SB006-BR-06	EW-08-SB007-BR-07	EW-08-SB008-BR-08	EW-08-SB009-BR-09	EW-08-SB011-BR-11	EW-08-SB012-BR-10	EW-08-SB013-BR-13
2,4'-DDD	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
2,4'-DDE	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
2,4'-DDT	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
4,4'-DDD	1.6 J	0.98 J	2.1 J	2.9 J	4.8 J	1.9 J	3.7 J	5.1 J	5.6 J
4,4'-DDE	10 J	7.0 J	8.4 J	17 J	49 J	11 J	30 J	21 J	16 J
4,4'-DDT	1.4 J	0.51 J	0.76 J	0.53 J	0.53 J	0.50 J	1.2 J	1.2 J	1.0 J
Total DDTs	13 J	8.5 J	11.3 J	20 J	54 J	13 J	35 J	27 J	23 J
Aldrin	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
Dieldrin	0.53 J	0.24 J	0.42 J	0.56 J	0.47 J	0.30 J	0.66 J	0.42 J	0.94 UJ
Total aldrin/dieldrin	0.53 J	0.24 J	0.42 J	0.56 J	0.47 J	0.30 J	0.66 J	0.42 J	0.94 UJ
alpha-BHC	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.31 J	0.58 J
beta-BHC	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
gamma-BHC	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
delta-BHC	R	R	R	R	R	R	0.89 UJ	0.89 UJ	0.94 UJ
alpha-Chlordane	0.72 J	0.51 J	0.62 J	1.0 J	1.3 J	0.60 J	1.4 J	1.2 J	0.66 J
beta-Chlordane	0.53 J	0.36 J	0.46 J	0.71 J	0.57 J	0.36 J	0.79 J	0.72 J	0.38 J
Total chlordane	4.2 J	2.8 J	3.3 J	6.3 J	13.7 J	4.4 J	9.3 J	7.1 J	4.6 J
Chlorpyrifos	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
alpha-Endosulfan	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
beta-Endosulfan	1.7 J	1.2 J	1.3 J	3.3 J	13 J	3.0 J	0.89 UJ	0.89 UJ	0.94 UJ
Endosulfan sulfate	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ

Chemical	Concentration(µg/kg ww)								
	Brown Rockfish – Whole Body								
	EW-08-SB004-BR-04	EW-08-SB005-BR-05	EW-08-SB006-BR-06	EW-08-SB007-BR-07	EW-08-SB008-BR-08	EW-08-SB009-BR-09	EW-08-SB011-BR-11	EW-08-SB012-BR-10	EW-08-SB013-BR-13
	8/11/2008	8/12/2008	8/12/2008	8/12/2008	8/12/2008	8/13/2008	8/13/2008	8/13/2008	10/24/2008
Endrin	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
Endrin aldehyde	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
Endrin ketone	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Heptachlor	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Heptachlor epoxide	0.47 UJ	0.45 UJ	0.47 UJ	0.14 J	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Isodrin	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
Methoxychlor	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Mirex	0.16 J	0.16 J	0.19 J	0.25 J	0.76 J	0.16 J	0.39 J	0.33 J	0.32 J
cis-Nonachlor	0.75 J	0.51 J	0.63 J	1.2 J	2.8 J	0.83 J	1.8 J	1.3 J	1.0 J
trans-Nonachlor	2.2 J	1.4 J	1.6 J	3.4 J	9.0 J	2.6 J	5.3 J	3.9 J	2.6 J
Octachlorostyrene	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Oxychlordane	2.4 UJ	2.3 UJ	2.4 UJ	2.3 UJ	2.2 UJ	2.1 UJ	2.3 UJ	2.3 UJ	2.4 UJ
Hexachlorobenzene	2.4 UJ	2.3 UJ	2.4 UJ	0.74 J	2.2 UJ	2.1 UJ	0.96 J	1.2 J	1.7 J

BHC – benzene hexachloride

DDD – dichlorodiphenyl dichloroethane

DDE – dichlorodiphenyl dichloroethylene

DDT – dichlorodiphenyl trichloroethane

J – estimated concentration

R – rejected

UJ – not detected at given concentration

ww – wet weight

Table 2. Organochlorine pesticide results from fish and crab composite tissue samples

Chemical	Concentration (µg/kg ww)				
	English Sole		Red Rock and Dungeness Crab		Shiner Surfperch
	Fillet with Skin	Whole Body	Edible Meat	Hepatopancreas	Whole Body
	EW08-ES-FL-SUPCOMP1	EW08-ES-WB-SUPCOMP2	EW08-RRDC-EM-SUPCOMP3	EW08-RRDC-HP-SUPCOMP3	EW08-SS-WB-SUPCOMP1
	9/2/2008	9/2/2008	8/26/2008	8/26/2008	9/2/2008
2,4'-DDD	0.66 J	0.83 J	0.83 UJ	0.93 UJ	0.52 J
2,4'-DDE	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
2,4'-DDT	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
4,4'-DDD	4.4 J	5.4 J	0.83 UJ	0.33 J	2.5 J
4,4'-DDE	7.6 J	9.3 J	2.1 UJ	6.9 J	7.1 J
4,4'-DDT	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.62 J
Total DDTs	12.7 J	15.5 J	2.1 UJ	7.2 J	10.7 J
Aldrin	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Dieldrin	0.28 J	0.39 J	0.83 UJ	0.93 UJ	0.76 J
Total aldrin/dieldrin	0.28 J	0.39 J	0.83 UJ	0.93 UJ	0.76 J
alpha-BHC	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
beta-BHC	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
gamma-BHC	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
delta-BHC	R	R	R	R	R
alpha-Chlordane	0.71 J	0.91 J	0.42 UJ	0.47 UJ	0.84 J
beta-Chlordane	0.39 J	0.50 J	0.42 UJ	0.47 UJ	0.57 J
Total chlordane	2.55 J	3.2 J	2.1 UJ	42 J	3.0 J
Chlorpyrifos	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
alpha-Endosulfan	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
beta-Endosulfan	1.0 J	1.8 J	0.83 UJ	0.93 UJ	0.86 UJ
Endosulfan sulfate	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Endrin	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Endrin aldehyde	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Endrin ketone	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ

Chemical	Concentration ($\mu\text{g/kg}$ ww)				
	English Sole		Red Rock and Dungeness Crab		Shiner Surfperch
	Fillet with Skin	Whole Body	Edible Meat	Hepatopancreas	Whole Body
	EW08-ES-FL-SUPCOMP1	EW08-ES-WB-SUPCOMP2	EW08-RRDC-EM-SUPCOMP3	EW08-RRDC-HP-SUPCOMP3	EW08-SS-WB-SUPCOMP1
	9/2/2008	9/2/2008	8/26/2008	8/26/2008	9/2/2008
Heptachlor	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
Heptachlor epoxide	0.44 UJ	0.46 UJ	0.42 UJ	0.14 J	0.43 UJ
Isodrin	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Methoxychlor	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
Mirex	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
cis-Nonachlor	0.46 J	0.51 J	0.42 UJ	0.18 J	0.40 J
trans-Nonachlor	0.99 J	1.3 J	0.42 UJ	0.62 J	1.2 J
Octachlorostyrene	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
Oxychlordane	2.2 UJ	2.3 UJ	2.1 UJ	41 J	2.2 UJ
Hexachlorobenzene	2.2 UJ	2.3 UJ	2.1 UJ	1.1 J	2.2 UJ

BHC – benzene hexachloride

DDD – dichlorodiphenyl dichloroethane

DDE – dichlorodiphenyl dichloroethylene

DDT – dichlorodiphenyl trichloroethane

J – estimated concentration

R – rejected

U – not detected at given concentration

ww – wet weight

Table 3. Organochlorine pesticide results from clam, cockle, geoduck, and mussel composite tissue samples

Chemical	Concentration ($\mu\text{g/kg ww}$)									
	Butter Clam				Cockle	Eastern Softshell Clam	Geoduck		Mussel	
	Whole Body				Whole Body	Whole Body	Edible Meat	Gutball	Whole Body	
	EW-B03-BC-03-comp1	EW-B06-BC-01-comp2	EW-B08-BC-01-comp2	EW-B10-BC-01-comp2	EW-B08-CN-02-comp1	EW-B09-MY-M-comp1	EW-S01-GD-Comp01	EW-S01-GD-GB-comp01	EW08-MS-WB-SUPCOMP1	
	7/30/2008	7/29/2008	7/31/2008	8/1/2008	7/31/2008	8/1/2008	10/25/2008	10/25/2008	8/27/2008	
2,4'-DDD	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
2,4'-DDE	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
2,4'-DDT	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
4,4'-DDD	0.55 J	0.48 J	0.85 UJ	0.82 UJ	0.85 UJ	0.16 J	0.88 UJ	0.27 J	0.17 J	
4,4'-DDE	2.2 UJ	2.2 UJ	2.2 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.4 UJ	
4,4'-DDT	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Total DDTs	0.55 J	0.48 J	2.2 UJ	2.1 UJ	2.2 UJ	0.16 J	2.2 UJ	0.27 J	0.17 J	
Aldrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Dieldrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Total aldrin/dieldrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
alpha-BHC	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	1.2 J	0.87 UJ	0.94 UJ	
beta-BHC	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	1.5 J	0.87 UJ	0.94 UJ	
gamma-BHC	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.18 J	0.44 UJ	0.47 UJ	
delta-BHC	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	R	R	R	
alpha-Chlordane	0.44 UJ	0.25 J	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ	
beta-Chlordane	0.44 UJ	0.28 J	0.43 UJ	0.14 J	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ	
Total chlordane	2.2 UJ	0.68 J	2.2 UJ	0.25 J	2.2 UJ	0.44 UJ	2.2 UJ	2.2 UJ	0.11 J	
Chlorpyrifos	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ	
alpha-Endosulfan	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	R	0.88 UJ	0.87 UJ	0.94 UJ	
beta-Endosulfan	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Endosulfan sulfate	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Endrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Endrin aldehyde	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	R	0.88 UJ	0.87 UJ	0.94 UJ	

Addendum – Fish/Shellfish Data Report

Attachment 2

March 2011

Chemical	Concentration ($\mu\text{g}/\text{kg}$ ww)								
	Butter Clam				Cockle	Eastern Softshell Clam	Geoduck		Mussel
	Whole Body				Whole Body	Whole Body	Edible Meat	Gutball	Whole Body
	EW-B03-BC-03-comp1	EW-B06-BC-01-comp2	EW-B08-BC-01-comp2	EW-B10-BC-01-comp2	EW-B08-CN-02-comp1	EW-B09-MY-M-comp1	EW-S01-GD-Comp01	EW-S01-GD-GB-comp01	EW08-MS-WB-SUPCOMP1
	7/30/2008	7/29/2008	7/31/2008	8/1/2008	7/31/2008	8/1/2008	10/25/2008	10/25/2008	8/27/2008
	Endrin ketone	0.44 J	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.47 UJ
Heptachlor	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.10 J
Heptachlor epoxide	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ
Isodrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ
Methoxychlor	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ
Mirex	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.11 J
cis-Nonachlor	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ
trans-Nonachlor	0.44 UJ	0.15 J	0.43 UJ	0.11 J	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.11 J
Octachlorostyrene	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ
Oxychlordane	2.2 UJ	2.2 UJ	2.2 UJ	2.1 UJ	2.2 UJ	R	2.2 UJ	2.2 UJ	2.4 UJ
Hexachlorobenzene	0.77 J	2.2 UJ	0.77 J	2.1 UJ	1.4 J	1.5 J	2.2 UJ	2.2 UJ	2.4 UJ

BHC – benzene hexachloride

DDD – dichlorodiphenyl dichloroethane

DDE – dichlorodiphenyl dichloroethylene

DDT – dichlorodiphenyl trichloroethane

J – estimated concentration

R – rejected

U – not detected at given concentration

ww – wet weight

ATTACHMENT 1 PESTICIDE RE-ANALYSIS MEMO

MEMORANDUM

To: Ravi Sanga, USEPA
From: Susan McGroddy and Nancy Judd, Windward LLC on behalf of the Port of Seattle
Subject: Estimated risk associated with pesticide tissue concentrations
Date: November 6, 2009

In order to determine whether or not additional analysis of tissue samples for pesticides is warranted, preliminary estimates of the human health risks associated with pesticide concentrations in fish, crab, clam and geoduck tissues were developed. There is uncertainty associated with the results of the pesticide analysis of the EW tissue samples due to the presence of PCB congeners in the samples. Analytical interference due to the presence of PCB congeners results in high bias for the detected pesticide concentrations as well as elevated reporting limits associated with nondetected results. The preliminary estimates of risk associated with these results were developed to determine whether or not the existing data results in unacceptably high risk estimates that require further analysis.

The only pesticides detected in tissues from EW were dieldrin, total DDTs, and cis-nonachlor. Dieldrin was detected in rockfish and shiner surfperch samples, and DDTs were detected in rockfish, crab, perch, and English sole samples. Cis-nonachlor was the only detected component of total chlordane, and it was only detected in one sample (red rock crab hepatopancreas).

A few preliminary risk estimates, using the higher of the maximum detected concentration or $\frac{1}{2}$ the maximum reporting limit (RL) as the EPCs for each seafood category and the exposure assumptions for the adult tribal RME (Tulalip data) scenario presented in the human health technical memo were developed. The EW excess cancer risk estimates were 4E-6 for total DDTs and 1E-4 for dieldrin. The risk estimates for the LDW for this scenario were 2E-5 for total DDTs and 1E-4 for dieldrin. A risk estimate for total chlordane for EW was not calculated but would be expected to be lower than that estimated for the LDW (6E-6) because detections were few for both Waterways and reporting limits for chlordanes for EWW were generally lower than those for the LDW.

There are fifteen other (undetected) pesticides for which toxicological data appropriate for risk assessment are available. Of these, six (mirex, methoxychlor, endrin ketone, endosulfan sulfate, alpha-endosulfan, and beta endosulfan) have maximum RLs below the risk based screening levels (RBCs) as described in the human health technical memo and would not be considered contaminants of potential concern (COPCs). The remaining nine (aldrin, alpha-BHC, beta-BHC, gamma-BHC, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, and toxaphene) have RLs exceeding the RBCs and will therefore be designated as COPCs for EW. These nine chemical were evaluated quantitatively in the LDW HHRA (in the risk characterization if they were ever detected and hypothetically in the uncertainty assessment if they were never

detected). A comparison of EW RLs and the concentrations from the LDW can be used to develop a crude estimate what risk estimates based on the EW RLs might be. None of these chemicals with non-cancer endpoints had hazard quotients (HQs) greater than 0.2 for the LDW for the adult Tribal RME (Tulalip data), and hypothetical EW non-cancer HQs would be expected to be well below 1 for EW for the same scenario. Carcinogenic risks for the adult tribal RME(Tulalip data) scenario for the LDW were as follows: toxaphene (5E-4), aldrin (4e-5), alpha-BHC(2E-5), beta-BHC (6E-6), and gamma-BHC(3E-6). Hypothetical excess cancer risk estimates (based on RLs) for the same scenario for EW would be expected to be similar for these chemicals.

The results are summarized in Table 1. Further analysis would result in reduced reporting limits for all the pesticides with the exception of toxaphene. Toxaphene is a complex mixture and is difficult to analyze. The proposed method developed by Columbia Analytical Services does not include Toxaphene as an analyte.

Table 1. Summary of preliminary pesticide evaluation

Chemical	Detected?	Above Screening Value?	Hazard Quotients	Carcinogenic Risks	More sensitive analysis possible?
Total DDTs	Yes	Yes	0.02	4×10^{-6}	yes
Dieldrin	Yes	Yes	0.15	1×10^{-4}	yes
Total Chlordane	Yes ^a	Yes	ne	ne	yes
Mirex	No	No	ne	ne	yes
Methoxychlor	No	No	ne	ne	yes
Endrin Ketone	No	No	ne	ne	yes
Endrin sulfate	No	No	ne	ne	yes
alpha endosulfan	No	No	ne	ne	yes
beta endosulfan	No	No	ne	ne	yes
Aldrin	No	Yes	0.09 ^b	4×10^{-5} ^b	yes
alpha BHC	No	Yes	0.005 ^b	2×10^{-5} ^b	yes
beta BHC	No	Yes	0.02 ^b	6×10^{-6} ^b	yes
gamma BHC (lindane)	No	Yes	0.01 ^b	3×10^{-6} ^b	yes
Endrin	No	Yes	0.01 ^b	ne	yes
Endrin aldehyde	No	Yes	0.02 ^b	ne	yes
Heptachlor	No	Yes	0.005 ^b	ne	yes
Heptachlor epoxide	No	Yes	0.2 ^b	ne	yes
Toxaphene	No	Yes	ne	5×10^{-4} ^b	no ^c

ne – not evaluated

^a One component of total chlordane (cis-nonachlor) was detected in one sample.

^b EW RLs were similar to the LDW RL values and the estimate risk is the result from the LDW analysis.

^cToxaphene has not been developed as an analyte for the MS/MS analysis due to the difficulties associated with analyzing complex mixtures such as toxaphene.

ATTACHMENT 2 DATA TABLES

Attachment 2

Table 1. Organochlorine pesticide results from brown rockfish individual tissue samples

Chemical	Concentration(µg/kg ww)								
	Brown Rockfish – Whole Body								
	EW-08-SB004-BR-04	EW-08-SB005-BR-05	EW-08-SB006-BR-06	EW-08-SB007-BR-07	EW-08-SB008-BR-08	EW-08-SB009-BR-09	EW-08-SB011-BR-11	EW-08-SB012-BR-10	EW-08-SB013-BR-13
2,4'-DDD	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
2,4'-DDE	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
2,4'-DDT	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
4,4'-DDD	1.6 J	0.98 J	2.1 J	2.9 J	4.8 J	1.9 J	3.7 J	5.1 J	5.6 J
4,4'-DDE	10 J	7.0 J	8.4 J	17 J	49 J	11 J	30 J	21 J	16 J
4,4'-DDT	1.4 J	0.51 J	0.76 J	0.53 J	0.53 J	0.50 J	1.2 J	1.2 J	1.0 J
Total DDTs	13 J	8.5 J	11.3 J	20 J	54 J	13 J	35 J	27 J	23 J
Aldrin	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
Dieldrin	0.53 J	0.24 J	0.42 J	0.56 J	0.47 J	0.30 J	0.66 J	0.42 J	0.94 UJ
Total aldrin/dieldrin	0.53 J	0.24 J	0.42 J	0.56 J	0.47 J	0.30 J	0.66 J	0.42 J	0.94 UJ
alpha-BHC	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.31 J	0.58 J
beta-BHC	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
gamma-BHC	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
delta-BHC	R	R	R	R	R	R	0.89 UJ	0.89 UJ	0.94 UJ
alpha-Chlordane	0.72 J	0.51 J	0.62 J	1.0 J	1.3 J	0.60 J	1.4 J	1.2 J	0.66 J
beta-Chlordane	0.53 J	0.36 J	0.46 J	0.71 J	0.57 J	0.36 J	0.79 J	0.72 J	0.38 J
Total chlordane	4.2 J	2.8 J	3.3 J	6.3 J	13.7 J	4.4 J	9.3 J	7.1 J	4.6 J
Chlorpyrifos	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
alpha-Endosulfan	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
beta-Endosulfan	1.7 J	1.2 J	1.3 J	3.3 J	13 J	3.0 J	0.89 UJ	0.89 UJ	0.94 UJ
Endosulfan sulfate	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ

Chemical	Concentration(µg/kg ww)								
	Brown Rockfish – Whole Body								
	EW-08-SB004-BR-04	EW-08-SB005-BR-05	EW-08-SB006-BR-06	EW-08-SB007-BR-07	EW-08-SB008-BR-08	EW-08-SB009-BR-09	EW-08-SB011-BR-11	EW-08-SB012-BR-10	EW-08-SB013-BR-13
	8/11/2008	8/12/2008	8/12/2008	8/12/2008	8/12/2008	8/13/2008	8/13/2008	8/13/2008	10/24/2008
Endrin	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
Endrin aldehyde	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
Endrin ketone	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Heptachlor	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Heptachlor epoxide	0.47 UJ	0.45 UJ	0.47 UJ	0.14 J	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Isodrin	0.93 UJ	0.89 UJ	0.94 UJ	0.89 UJ	0.88 UJ	0.82 UJ	0.89 UJ	0.89 UJ	0.94 UJ
Methoxychlor	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Mirex	0.16 J	0.16 J	0.19 J	0.25 J	0.76 J	0.16 J	0.39 J	0.33 J	0.32 J
cis-Nonachlor	0.75 J	0.51 J	0.63 J	1.2 J	2.8 J	0.83 J	1.8 J	1.3 J	1.0 J
trans-Nonachlor	2.2 J	1.4 J	1.6 J	3.4 J	9.0 J	2.6 J	5.3 J	3.9 J	2.6 J
Octachlorostyrene	0.47 UJ	0.45 UJ	0.47 UJ	0.45 UJ	0.44 UJ	0.41 UJ	0.45 UJ	0.45 UJ	0.47 UJ
Oxychlordane	2.4 UJ	2.3 UJ	2.4 UJ	2.3 UJ	2.2 UJ	2.1 UJ	2.3 UJ	2.3 UJ	2.4 UJ
Hexachlorobenzene	2.4 UJ	2.3 UJ	2.4 UJ	0.74 J	2.2 UJ	2.1 UJ	0.96 J	1.2 J	1.7 J

BHC – benzene hexachloride

DDD – dichlorodiphenyl dichloroethane

DDE – dichlorodiphenyl dichloroethylene

DDT – dichlorodiphenyl trichloroethane

J – estimated concentration

R – rejected

UJ – not detected at given concentration

ww – wet weight

Table 2. Organochlorine pesticide results from fish and crab composite tissue samples

Chemical	Concentration (µg/kg ww)				
	English Sole		Red Rock and Dungeness Crab		Shiner Surfperch
	Fillet with Skin	Whole Body	Edible Meat	Hepatopancreas	Whole Body
	EW08-ES-FL-SUPCOMP1	EW08-ES-WB-SUPCOMP2	EW08-RRDC-EM-SUPCOMP3	EW08-RRDC-HP-SUPCOMP3	EW08-SS-WB-SUPCOMP1
	9/2/2008	9/2/2008	8/26/2008	8/26/2008	9/2/2008
2,4'-DDD	0.66 J	0.83 J	0.83 UJ	0.93 UJ	0.52 J
2,4'-DDE	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
2,4'-DDT	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
4,4'-DDD	4.4 J	5.4 J	0.83 UJ	0.33 J	2.5 J
4,4'-DDE	7.6 J	9.3 J	2.1 UJ	6.9 J	7.1 J
4,4'-DDT	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.62 J
Total DDTs	12.7 J	15.5 J	2.1 UJ	7.2 J	10.7 J
Aldrin	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Dieldrin	0.28 J	0.39 J	0.83 UJ	0.93 UJ	0.76 J
Total aldrin/dieldrin	0.28 J	0.39 J	0.83 UJ	0.93 UJ	0.76 J
alpha-BHC	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
beta-BHC	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
gamma-BHC	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
delta-BHC	R	R	R	R	R
alpha-Chlordane	0.71 J	0.91 J	0.42 UJ	0.47 UJ	0.84 J
beta-Chlordane	0.39 J	0.50 J	0.42 UJ	0.47 UJ	0.57 J
Total chlordane	2.55 J	3.2 J	2.1 UJ	42 J	3.0 J
Chlorpyrifos	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
alpha-Endosulfan	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
beta-Endosulfan	1.0 J	1.8 J	0.83 UJ	0.93 UJ	0.86 UJ
Endosulfan sulfate	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Endrin	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Endrin aldehyde	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Endrin ketone	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ

Chemical	Concentration ($\mu\text{g/kg}$ ww)				
	English Sole		Red Rock and Dungeness Crab		Shiner Surfperch
	Fillet with Skin	Whole Body	Edible Meat	Hepatopancreas	Whole Body
	EW08-ES-FL-SUPCOMP1	EW08-ES-WB-SUPCOMP2	EW08-RRDC-EM-SUPCOMP3	EW08-RRDC-HP-SUPCOMP3	EW08-SS-WB-SUPCOMP1
Chemical	9/2/2008	9/2/2008	8/26/2008	8/26/2008	9/2/2008
Heptachlor	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
Heptachlor epoxide	0.44 UJ	0.46 UJ	0.42 UJ	0.14 J	0.43 UJ
Isodrin	0.88 UJ	0.92 UJ	0.83 UJ	0.93 UJ	0.86 UJ
Methoxychlor	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
Mirex	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
cis-Nonachlor	0.46 J	0.51 J	0.42 UJ	0.18 J	0.40 J
trans-Nonachlor	0.99 J	1.3 J	0.42 UJ	0.62 J	1.2 J
Octachlorostyrene	0.44 UJ	0.46 UJ	0.42 UJ	0.47 UJ	0.43 UJ
Oxychlordane	2.2 UJ	2.3 UJ	2.1 UJ	41 J	2.2 UJ
Hexachlorobenzene	2.2 UJ	2.3 UJ	2.1 UJ	1.1 J	2.2 UJ

BHC – benzene hexachloride

DDD – dichlorodiphenyl dichloroethane

DDE – dichlorodiphenyl dichloroethylene

DDT – dichlorodiphenyl trichloroethane

J – estimated concentration

R – rejected

U – not detected at given concentration

ww – wet weight

Table 3. Organochlorine pesticide results from clam, cockle, geoduck, and mussel composite tissue samples

Chemical	Concentration ($\mu\text{g/kg ww}$)									
	Butter Clam				Cockle	Eastern Softshell Clam	Geoduck		Mussel	
	Whole Body				Whole Body	Whole Body	Edible Meat	Gutball	Whole Body	
	EW-B03-BC-03-comp1	EW-B06-BC-01-comp2	EW-B08-BC-01-comp2	EW-B10-BC-01-comp2	EW-B08-CN-02-comp1	EW-B09-MY-M-comp1	EW-S01-GD-Comp01	EW-S01-GD-GB-comp01	EW08-MS-WB-SUPCOMP1	
	7/30/2008	7/29/2008	7/31/2008	8/1/2008	7/31/2008	8/1/2008	10/25/2008	10/25/2008	8/27/2008	
2,4'-DDD	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
2,4'-DDE	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
2,4'-DDT	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
4,4'-DDD	0.55 J	0.48 J	0.85 UJ	0.82 UJ	0.85 UJ	0.16 J	0.88 UJ	0.27 J	0.17 J	
4,4'-DDE	2.2 UJ	2.2 UJ	2.2 UJ	2.1 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.4 UJ	
4,4'-DDT	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Total DDTs	0.55 J	0.48 J	2.2 UJ	2.1 UJ	2.2 UJ	0.16 J	2.2 UJ	0.27 J	0.17 J	
Aldrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Dieldrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Total aldrin/dieldrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
alpha-BHC	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	1.2 J	0.87 UJ	0.94 UJ	
beta-BHC	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	1.5 J	0.87 UJ	0.94 UJ	
gamma-BHC	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.18 J	0.44 UJ	0.47 UJ	
delta-BHC	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	R	R	R	
alpha-Chlordane	0.44 UJ	0.25 J	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ	
beta-Chlordane	0.44 UJ	0.28 J	0.43 UJ	0.14 J	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ	
Total chlordane	2.2 UJ	0.68 J	2.2 UJ	0.25 J	2.2 UJ	0.44 UJ	2.2 UJ	2.2 UJ	0.11 J	
Chlorpyrifos	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ	
alpha-Endosulfan	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	R	0.88 UJ	0.87 UJ	0.94 UJ	
beta-Endosulfan	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Endosulfan sulfate	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Endrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ	
Endrin aldehyde	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	R	0.88 UJ	0.87 UJ	0.94 UJ	

Addendum – Fish/Shellfish Data Report

Attachment 2

March 2011

Chemical	Concentration ($\mu\text{g}/\text{kg}$ ww)								
	Butter Clam				Cockle	Eastern Softshell Clam	Geoduck		Mussel
	Whole Body				Whole Body	Whole Body	Edible Meat	Gutball	Whole Body
	EW-B03-BC-03-comp1	EW-B06-BC-01-comp2	EW-B08-BC-01-comp2	EW-B10-BC-01-comp2	EW-B08-CN-02-comp1	EW-B09-MY-M-comp1	EW-S01-GD-Comp01	EW-S01-GD-GB-comp01	EW08-MS-WB-SUPCOMP1
	7/30/2008	7/29/2008	7/31/2008	8/1/2008	7/31/2008	8/1/2008	10/25/2008	10/25/2008	8/27/2008
	Endrin ketone	0.44 J	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.47 UJ
Heptachlor	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.10 J
Heptachlor epoxide	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ
Isodrin	0.87 UJ	0.87 UJ	0.85 UJ	0.82 UJ	0.85 UJ	0.87 UJ	0.88 UJ	0.87 UJ	0.94 UJ
Methoxychlor	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ
Mirex	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.11 J
cis-Nonachlor	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ
trans-Nonachlor	0.44 UJ	0.15 J	0.43 UJ	0.11 J	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.11 J
Octachlorostyrene	0.44 UJ	0.44 UJ	0.43 UJ	0.41 UJ	0.43 UJ	0.44 UJ	0.44 UJ	0.44 UJ	0.47 UJ
Oxychlordane	2.2 UJ	2.2 UJ	2.2 UJ	2.1 UJ	2.2 UJ	R	2.2 UJ	2.2 UJ	2.4 UJ
Hexachlorobenzene	0.77 J	2.2 UJ	0.77 J	2.1 UJ	1.4 J	1.5 J	2.2 UJ	2.2 UJ	2.4 UJ

BHC – benzene hexachloride

DDD – dichlorodiphenyldichloroethane

DDE – dichlorodiphenyldichloroethylene

DDT – dichlorodiphenyltrichloroethane

J – estimated concentration

R – rejected

U – not detected at given concentration

ww – wet weight

ATTACHMENT 3 LABORATORY DATA FORMS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	08/08/2009
Sample Matrix:	Animal tissue	Date Received:	04/07/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW08-MS-WB-SUPCOMP1	Units:	ug/Kg
Lab Code:	K1003360-001	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.94	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.47	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND	U	0.94	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND	U	0.94	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.4	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	0.10	J	0.47	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND	U	0.47	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND	U	0.94	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND	U	0.47	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND	U	0.94	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND	U	2.4	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.47	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND	U	0.94	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	ND	U	0.47	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	ND	U	0.47	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	0.11	J	0.47	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND	U	0.94	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	ND	U	2.4	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	ND	U	0.94	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	ND	U	0.94	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND	U	0.94	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND	U	0.94	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	ND	U	0.47	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	0.17	J	0.94	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	ND	U	0.94	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND	U	0.94	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND	U	0.94	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.94	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND	U	0.47	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND	U	0.47	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	0.11	J	0.47	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/08/2009
Date Received: 04/07/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-MS-WB-SUPCOMP1 **Units:** ug/Kg
Lab Code: K1003360-001 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	80	5-124	05/21/10	Acceptable
S_HXCBZ13C6	66	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	104	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	82	5-120	05/21/10	Acceptable
S_Aldrin-13C12	76	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	77	5-120	05/21/10	Acceptable
S_Isodrin-13C12	86	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	80	5-144	05/21/10	Acceptable
S_Heptachlrepx13C10	77	8-146	05/21/10	Acceptable
S_Endrin-13C12	76	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	71	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	63	13-200	05/21/10	Acceptable
S_Mxchlord14	69	8-200	05/21/10	Acceptable
S_Endrinket13C12	61	5-120	05/21/10	Acceptable
S_Mirex-13C10	53	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue **Service Request:** K1003360
Date Collected: 08/08/2009
Date Received: 04/07/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-MS-WB-SUPCOMP2 **Units:** ug/Kg
Lab Code: K1003360-002 **Basis:** Wet
Extraction Method: EPA 3541 **Level:** Low
Analysis Method: CAS SOC-PESTMS2

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.81	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.41	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND	U	0.81	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND	U	0.81	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.1	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND	U	0.41	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND	U	0.41	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND	U	0.81	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND	U	0.41	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND	U	0.81	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND	U	2.1	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.41	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND	U	0.81	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	0.15	J	0.41	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	0.13	J	0.41	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	0.13	J	0.41	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND	U	0.81	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	ND	U	2.1	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	ND	U	0.81	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	ND	U	0.81	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND	U	0.81	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND	U	0.81	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	ND	U	0.41	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	0.20	J	0.81	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	ND	U	0.81	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND	U	0.81	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND	U	0.81	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.81	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND	U	0.41	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND	U	0.41	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	ND	U	0.41	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/08/2009
Date Received: 04/07/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-MS-WB-SUPCOMP2 **Units:** ug/Kg
Lab Code: K1003360-002 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	81	5-124	05/21/10	Acceptable
S_HXCBZ13C6	43	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	114	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	79	5-120	05/21/10	Acceptable
S_Aldrin-13C12	75	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	75	5-120	05/21/10	Acceptable
S_Isodrin-13C12	88	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	75	5-144	05/21/10	Acceptable
S_Heptachlrepx13C10	62	8-146	05/21/10	Acceptable
S_Endrin-13C12	75	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	69	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	63	13-200	05/21/10	Acceptable
S_Mxchlord14	75	8-200	05/21/10	Acceptable
S_Endrinket13C12	60	5-120	05/21/10	Acceptable
S_Mirex-13C10	51	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	08/08/2009
Sample Matrix:	Animal tissue	Date Received:	04/07/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW08-MS-WB-SUPCOMP3	Units:	ug/Kg
Lab Code:	K1003360-003	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.72	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.36	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND	U	0.72	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND	U	0.72	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND	U	1.8	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND	U	0.36	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND	U	0.36	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND	U	0.72	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND	U	0.36	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND	U	0.72	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND	U	1.8	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.36	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND	U	0.72	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	ND	U	0.36	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	ND	U	0.36	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	ND	U	0.36	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND	U	0.72	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	ND	U	1.8	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	ND	U	0.72	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	ND	U	0.72	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND	U	0.72	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND	U	0.72	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	ND	U	0.36	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	0.16	J	0.72	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	ND	U	0.72	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND	U	0.72	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND	U	0.72	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.72	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND	U	0.36	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND	U	0.36	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	ND	U	0.36	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/08/2009
Date Received: 04/07/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-MS-WB-SUPCOMP3 **Units:** ug/Kg
Lab Code: K1003360-003 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	76	5-124	05/21/10	Acceptable
S_HXCBZ13C6	58	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	106	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	78	5-120	05/21/10	Acceptable
S_Aldrin-13C12	69	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	74	5-120	05/21/10	Acceptable
S_Isodrin-13C12	85	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	76	5-144	05/21/10	Acceptable
S_Heptachlrepx13C10	64	8-146	05/21/10	Acceptable
S_Endrin-13C12	74	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	67	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	70	13-200	05/21/10	Acceptable
S_Mxchlord14	78	8-200	05/21/10	Acceptable
S_Endrinket13C12	61	5-120	05/21/10	Acceptable
S_Mirex-13C10	52	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	05/28/2009
Sample Matrix:	Animal tissue	Date Received:	06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW08-RRDC-EM-SUPCOMP3	Units:	ug/Kg
Lab Code:	K1003360-006	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.83	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.42	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND	U	0.83	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND	U	0.83	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.1	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND	U	0.42	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND	U	0.42	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND	U	0.83	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND	U	0.42	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND	U	0.83	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND	U	2.1	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.42	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND	U	0.83	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	ND	U	0.42	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	ND	U	0.42	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	ND	U	0.42	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND	U	0.83	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	ND	U	2.1	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	ND	U	0.83	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	ND	U	0.83	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND	U	0.83	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND	U	0.83	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	ND	U	0.42	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	ND	U	0.83	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	ND	U	0.83	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND	U	0.83	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND	U	0.83	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.83	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND	U	0.42	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND	U	0.42	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	ND	U	0.42	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 05/28/2009
Date Received: 06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-RRDC-EM-SUPCOMP3 **Units:** ug/Kg
Lab Code: K1003360-006 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	60	5-124	05/21/10	Acceptable
S_HXCBZ13C6	43	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	96	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	71	5-120	05/21/10	Acceptable
S_Aldrin-13C12	58	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	65	5-120	05/21/10	Acceptable
S_Isodrin-13C12	70	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	65	5-144	05/21/10	Acceptable
S_Heptachlrepxo13C10	63	8-146	05/21/10	Acceptable
S_Endrin-13C12	71	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	64	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	62	13-200	05/21/10	Acceptable
S_Mxchlord14	70	8-200	05/21/10	Acceptable
S_Endrinket13C12	57	5-120	05/21/10	Acceptable
S_Mirex-13C10	49	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	05/28/2009
Sample Matrix:	Animal tissue	Date Received:	06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW08-RRDC-HP-SUPCOMP3	Units:	ug/Kg
Lab Code:	K1003360-009	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND U	0.93	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND U	0.47	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND U	0.93	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND U	0.93	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	1.1 J	2.4	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND U	0.47	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND U	0.47	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND U	0.93	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND U	0.47	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND U	0.93	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	41	2.4	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	0.14 J	0.47	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND U	0.93	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	ND U	0.47	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	ND U	0.47	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	0.62	0.47	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND U	0.93	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	6.9	2.4	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	ND U	0.93	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	ND U	0.93	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND U	0.93	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND U	0.93	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	0.18 J	0.47	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	0.33 J	0.93	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	ND U	0.93	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND U	0.93	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND U	0.93	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND U	0.93	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND U	0.47	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND U	0.47	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	ND U	0.47	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 05/28/2009
Date Received: 06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-RRDC-HP-SUPCOMP3 **Units:** ug/Kg
Lab Code: K1003360-009 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	86	5-124	05/21/10	Acceptable
S_HXCBZ13C6	42	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	115	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	82	5-120	05/21/10	Acceptable
S_Aldrin-13C12	78	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	82	5-120	05/21/10	Acceptable
S_Isodrin-13C12	99	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	87	5-144	05/21/10	Acceptable
S_Heptachlrepx13C10	68	8-146	05/21/10	Acceptable
S_Endrin-13C12	78	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	74	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	75	13-200	05/21/10	Acceptable
S_Mxchlord14	83	8-200	05/21/10	Acceptable
S_Endrinket13C12	66	5-120	05/21/10	Acceptable
S_Mirex-13C10	57	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	05/28/2009
Sample Matrix:	Animal tissue	Date Received:	06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW08-ES-WB-SUPCOMP2	Units:	ug/Kg
Lab Code:	K1003360-011	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND U	0.92	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND U	0.46	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND U	0.92	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND U	0.92	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND U	2.3	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND U	0.46	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND U	0.46	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND U	0.92	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND U	0.46	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND U	0.92	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND U	2.3	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND U	0.46	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND U	0.92	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	0.50	0.46	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	0.91	0.46	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	1.3	0.46	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND U	0.92	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	9.3	2.3	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	0.83 J	0.92	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	0.39 J	0.92	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND U	0.92	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND U	0.92	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	0.51	0.46	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	5.4	0.92	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	1.8	0.92	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND U	0.92	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND U	0.92	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND U	0.92	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND U	0.46	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND U	0.46	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	ND U	0.46	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 05/28/2009
Date Received: 06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-ES-WB-SUPCOMP2 **Units:** ug/Kg
Lab Code: K1003360-011 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	67	5-124	05/21/10	Acceptable
S_HXCBZ13C6	41	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	116	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	72	5-120	05/21/10	Acceptable
S_Aldrin-13C12	70	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	71	5-120	05/21/10	Acceptable
S_Isodrin-13C12	81	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	66	5-144	05/21/10	Acceptable
S_Heptachlrepx13C10	60	8-146	05/21/10	Acceptable
S_Endrin-13C12	70	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	65	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	64	13-200	05/21/10	Acceptable
S_Mxchlord14	74	8-200	05/21/10	Acceptable
S_Endrinket13C12	56	5-120	05/21/10	Acceptable
S_Mirex-13C10	49	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue **Service Request:** K1003360
Date Collected: 05/28/2009
Date Received: 06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-ES-FL-SUPCOMP1 **Units:** ug/Kg
Lab Code: K1003360-013 **Basis:** Wet
Extraction Method: EPA 3541 **Level:** Low
Analysis Method: CAS SOC-PESTMS2

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.88	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.44	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND	U	0.88	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND	U	0.88	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.2	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND	U	0.44	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND	U	0.44	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND	U	0.88	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND	U	0.44	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND	U	0.88	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND	U	2.2	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.44	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND	U	0.88	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	0.39	J	0.44	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	0.71		0.44	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	0.99		0.44	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND	U	0.88	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	7.6		2.2	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	0.66	J	0.88	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	0.28	J	0.88	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND	U	0.88	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND	U	0.88	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	0.46		0.44	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	4.4		0.88	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	1.0		0.88	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND	U	0.88	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND	U	0.88	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.88	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND	U	0.44	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND	U	0.44	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	ND	U	0.44	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 05/28/2009
Date Received: 06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-ES-FL-SUPCOMP1 **Units:** ug/Kg
Lab Code: K1003360-013 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	78	5-124	05/21/10	Acceptable
S_HXCBZ13C6	64	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	134	5-128	05/21/10	Outside Control Limits
S_Chlorpyrifos-d10	77	5-120	05/21/10	Acceptable
S_Aldrin-13C12	73	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	76	5-120	05/21/10	Acceptable
S_Isodrin-13C12	91	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	74	5-144	05/21/10	Acceptable
S_Heptachlrepx13C10	62	8-146	05/21/10	Acceptable
S_Endrin-13C12	74	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	69	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	61	13-200	05/21/10	Acceptable
S_Mxchlord14	74	8-200	05/21/10	Acceptable
S_Endrinket13C12	57	5-120	05/21/10	Acceptable
S_Mirex-13C10	49	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	05/28/2009
Sample Matrix:	Animal tissue	Date Received:	06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW08-SS-WB-SUPCOMP1	Units:	ug/Kg
Lab Code:	K1003360-016	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.86	0.26	1	05/07/10	05/24/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.43	0.17	1	05/07/10	05/24/10	KWG1004738	
beta-BHC	ND	U	0.86	0.40	1	05/07/10	05/24/10	KWG1004738	*
delta-BHC	ND	U	0.86	0.28	1	05/07/10	05/24/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.2	0.70	1	05/07/10	05/24/10	KWG1004738	
Heptachlor	ND	U	0.43	0.090	1	05/07/10	05/24/10	KWG1004738	
Chlorpyrifos	ND	U	0.43	0.13	1	05/07/10	05/24/10	KWG1004738	
Aldrin	ND	U	0.86	0.22	1	05/07/10	05/24/10	KWG1004738	
Octachlorostyrene	ND	U	0.43	0.16	1	05/07/10	05/24/10	KWG1004738	
Isodrin	ND	U	0.86	0.23	1	05/07/10	05/24/10	KWG1004738	
Oxychlordane	ND	U	2.2	0.77	1	05/07/10	05/24/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.43	0.061	1	05/07/10	05/24/10	KWG1004738	
2,4'-DDE	ND	U	0.86	0.42	1	05/07/10	05/24/10	KWG1004738	*
gamma-Chlordane	0.57		0.43	0.13	1	05/07/10	05/24/10	KWG1004738	
alpha-Chlordane	0.84		0.43	0.12	1	05/07/10	05/24/10	KWG1004738	
trans-Nonachlor	1.2		0.43	0.094	1	05/07/10	05/24/10	KWG1004738	
Endosulfan I	ND	U	0.86	0.42	1	05/07/10	05/24/10	KWG1004738	
4,4'-DDE	7.1		2.2	0.70	1	05/07/10	05/24/10	KWG1004738	*
2,4'-DDD	0.52	J	0.86	0.31	1	05/07/10	05/24/10	KWG1004738	*
Dieldrin	0.76	J	0.86	0.22	1	05/07/10	05/24/10	KWG1004738	
Endrin	ND	U	0.86	0.45	1	05/07/10	05/24/10	KWG1004738	
2,4'-DDT	ND	U	0.86	0.46	1	05/07/10	05/24/10	KWG1004738	*
cis-Nonachlor	0.40	J	0.43	0.13	1	05/07/10	05/24/10	KWG1004738	
4,4'-DDD	2.5		0.86	0.13	1	05/07/10	05/24/10	KWG1004738	
Endosulfan II	ND	U	0.86	0.35	1	05/07/10	05/24/10	KWG1004738	
Endrin Aldehyde	ND	U	0.86	0.56	1	05/07/10	05/24/10	KWG1004738	*
4,4'-DDT	0.62	J	0.86	0.35	1	05/07/10	05/24/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.86	0.22	1	05/07/10	05/24/10	KWG1004738	*
Methoxychlor	ND	U	0.43	0.15	1	05/07/10	05/24/10	KWG1004738	
Endrin Ketone	ND	U	0.43	0.16	1	05/07/10	05/24/10	KWG1004738	
Mirex	ND	U	0.43	0.11	1	05/07/10	05/24/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 05/28/2009
Date Received: 06/24/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW08-SS-WB-SUPCOMP1 **Units:** ug/Kg
Lab Code: K1003360-016 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	63	5-124	05/24/10	Acceptable
S_HXCBZ13C6	56	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	102	5-128	05/24/10	Acceptable
S_Chlorpyrifos-d10	64	5-120	05/24/10	Acceptable
S_Aldrin-13C12	63	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	62	5-120	05/24/10	Acceptable
S_Isodrin-13C12	79	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	61	5-144	05/24/10	Acceptable
S_Heptachlrepx13C10	52	8-146	05/24/10	Acceptable
S_Endrin-13C12	62	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	53	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	44	13-200	05/24/10	Acceptable
S_Mxchlord14	50	8-200	05/24/10	Acceptable
S_Endrinket13C12	43	5-120	05/24/10	Acceptable
S_Mirex-13C10	37	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue **Service Request:** K1003360
Date Collected:
Date Received: 09/07/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-S01-GD-Comp01 **Units:** ug/Kg
Lab Code: K1003360-025 **Basis:** Wet
Extraction Method: EPA 3541 **Level:** Low
Analysis Method: CAS SOC-PESTMS2

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	1.2		0.88	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	0.18	J	0.44	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	1.5		0.88	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND	U	0.88	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.2	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND	U	0.44	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND	U	0.44	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND	U	0.88	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND	U	0.44	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND	U	0.88	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND	U	2.2	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.44	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND	U	0.88	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	ND	U	0.44	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	ND	U	0.44	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	ND	U	0.44	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND	U	0.88	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	ND	U	2.2	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	ND	U	0.88	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	ND	U	0.88	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND	U	0.88	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND	U	0.88	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	ND	U	0.44	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	ND	U	0.88	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	ND	U	0.88	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND	U	0.88	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND	U	0.88	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.88	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND	U	0.44	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND	U	0.44	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	ND	U	0.44	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected:
Date Received: 09/07/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-S01-GD-Comp01 **Units:** ug/Kg
Lab Code: K1003360-025 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	74	5-124	05/21/10	Acceptable
S_HXCBZ13C6	60	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	120	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	79	5-120	05/21/10	Acceptable
S_Aldrin-13C12	71	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	73	5-120	05/21/10	Acceptable
S_Isodrin-13C12	83	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	74	5-144	05/21/10	Acceptable
S_Heptachlrepxo13C10	63	8-146	05/21/10	Acceptable
S_Endrin-13C12	72	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	65	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	67	13-200	05/21/10	Acceptable
S_Mxchlord14	77	8-200	05/21/10	Acceptable
S_Endrinket13C12	59	5-120	05/21/10	Acceptable
S_Mirex-13C10	50	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	
Sample Matrix:	Animal tissue	Date Received:	09/07/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-S01-GD-GB-Comp01	Units:	ug/Kg
Lab Code:	K1003360-026	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.87	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.44	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND	U	0.87	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND	U	0.87	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.2	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND	U	0.44	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND	U	0.44	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND	U	0.87	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND	U	0.44	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND	U	0.87	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND	U	2.2	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.44	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND	U	0.87	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	ND	U	0.44	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	ND	U	0.44	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	ND	U	0.44	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND	U	0.87	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	ND	U	2.2	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	ND	U	0.87	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	ND	U	0.87	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND	U	0.87	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND	U	0.87	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	ND	U	0.44	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	0.27	J	0.87	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	ND	U	0.87	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND	U	0.87	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND	U	0.87	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.87	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND	U	0.44	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND	U	0.44	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	ND	U	0.44	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected:
Date Received: 09/07/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-S01-GD-GB-Comp01 **Units:** ug/Kg
Lab Code: K1003360-026 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	79	5-124	05/21/10	Acceptable
S_HXCBZ13C6	44	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	127	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	76	5-120	05/21/10	Acceptable
S_Aldrin-13C12	72	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	78	5-120	05/21/10	Acceptable
S_Isodrin-13C12	88	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	76	5-144	05/21/10	Acceptable
S_Heptachlrepox13C10	68	8-146	05/21/10	Acceptable
S_Endrin-13C12	77	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	70	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	72	13-200	05/21/10	Acceptable
S_Mxchlord14	84	8-200	05/21/10	Acceptable
S_Endrinket13C12	64	5-120	05/21/10	Acceptable
S_Mirex-13C10	53	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-08-SB004-BR-04	Units:	ug/Kg
Lab Code:	K1003360-027	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.93	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.47	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND	U	0.93	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND	U	0.93	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.4	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND	U	0.47	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND	U	0.47	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND	U	0.93	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND	U	0.47	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND	U	0.93	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND	U	2.4	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.47	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND	U	0.93	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	0.53		0.47	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	0.72		0.47	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	2.2		0.47	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND	U	0.93	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	10		2.4	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	ND	U	0.93	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	0.53	J	0.93	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND	U	0.93	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND	U	0.93	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	0.75		0.47	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	1.6		0.93	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	1.7		0.93	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND	U	0.93	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	1.4		0.93	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.93	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND	U	0.47	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND	U	0.47	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	0.16	J	0.47	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB004-BR-04 **Units:** ug/Kg
Lab Code: K1003360-027 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	83	5-124	05/21/10	Acceptable
S_HXCBZ13C6	40	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	117	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	79	5-120	05/21/10	Acceptable
S_Aldrin-13C12	74	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	77	5-120	05/21/10	Acceptable
S_Isodrin-13C12	89	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	79	5-144	05/21/10	Acceptable
S_Heptachlrepx13C10	68	8-146	05/21/10	Acceptable
S_Endrin-13C12	72	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	69	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	67	13-200	05/21/10	Acceptable
S_Mxchlord14	78	8-200	05/21/10	Acceptable
S_Endrinket13C12	61	5-120	05/21/10	Acceptable
S_Mirex-13C10	51	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue **Service Request:** K1003360
Date Collected: 08/11/2008 **Date Received:** 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB005-BR-05 **Units:** ug/Kg
Lab Code: K1003360-028 **Basis:** Wet
Extraction Method: EPA 3541 **Level:** Low
Analysis Method: CAS SOC-PESTMS2

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.89	0.26	1	05/07/10	05/22/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.45	0.17	1	05/07/10	05/22/10	KWG1004738	
beta-BHC	ND	U	0.89	0.40	1	05/07/10	05/22/10	KWG1004738	*
delta-BHC	ND	U	0.89	0.28	1	05/07/10	05/22/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.3	0.70	1	05/07/10	05/22/10	KWG1004738	
Heptachlor	ND	U	0.45	0.090	1	05/07/10	05/22/10	KWG1004738	
Chlorpyrifos	ND	U	0.45	0.13	1	05/07/10	05/22/10	KWG1004738	
Aldrin	ND	U	0.89	0.22	1	05/07/10	05/22/10	KWG1004738	
Octachlorostyrene	ND	U	0.45	0.16	1	05/07/10	05/22/10	KWG1004738	
Isodrin	ND	U	0.89	0.23	1	05/07/10	05/22/10	KWG1004738	
Oxychlordane	ND	U	2.3	0.77	1	05/07/10	05/22/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.45	0.061	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDE	ND	U	0.89	0.42	1	05/07/10	05/22/10	KWG1004738	*
gamma-Chlordane	0.36	J	0.45	0.13	1	05/07/10	05/22/10	KWG1004738	
alpha-Chlordane	0.51		0.45	0.12	1	05/07/10	05/22/10	KWG1004738	
trans-Nonachlor	1.4		0.45	0.094	1	05/07/10	05/22/10	KWG1004738	
Endosulfan I	ND	U	0.89	0.42	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDE	7.0		2.3	0.70	1	05/07/10	05/22/10	KWG1004738	*
2,4'-DDD	ND	U	0.89	0.31	1	05/07/10	05/22/10	KWG1004738	*
Dieldrin	0.24	J	0.89	0.22	1	05/07/10	05/22/10	KWG1004738	
Endrin	ND	U	0.89	0.45	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDT	ND	U	0.89	0.46	1	05/07/10	05/22/10	KWG1004738	*
cis-Nonachlor	0.51		0.45	0.13	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDD	0.98		0.89	0.13	1	05/07/10	05/22/10	KWG1004738	
Endosulfan II	1.2		0.89	0.35	1	05/07/10	05/22/10	KWG1004738	
Endrin Aldehyde	ND	U	0.89	0.56	1	05/07/10	05/22/10	KWG1004738	*
4,4'-DDT	0.51	J	0.89	0.35	1	05/07/10	05/22/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.89	0.22	1	05/07/10	05/22/10	KWG1004738	*
Methoxychlor	ND	U	0.45	0.15	1	05/07/10	05/22/10	KWG1004738	
Endrin Ketone	ND	U	0.45	0.16	1	05/07/10	05/22/10	KWG1004738	
Mirex	0.16	J	0.45	0.11	1	05/07/10	05/22/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB005-BR-05 **Units:** ug/Kg
Lab Code: K1003360-028 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	81	5-124	05/22/10	Acceptable
S_HXCBZ13C6	44	5-120	05/22/10	Acceptable
S_Heptachlor-13C10	124	5-128	05/22/10	Acceptable
S_Chlorpyrifos-d10	79	5-120	05/22/10	Acceptable
S_Aldrin-13C12	72	6-113	05/22/10	Acceptable
S_Ocstyrene13C8	78	5-120	05/22/10	Acceptable
S_Isodrin-13C12	89	5-120	05/22/10	Acceptable
S_Oxychlordane-13C10	78	5-144	05/22/10	Acceptable
S_Heptachlrepxo13C10	66	8-146	05/22/10	Acceptable
S_Endrin-13C12	76	20-157	05/22/10	Acceptable
S_4,4'DDD-d4	70	5-120	05/22/10	Acceptable
S_4,4'-DDT-d4	69	13-200	05/22/10	Acceptable
S_Mxchlord14	79	8-200	05/22/10	Acceptable
S_Endrinket13C12	61	5-120	05/22/10	Acceptable
S_Mirex-13C10	52	5-138	05/22/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB006-BR-06 **Units:** ug/Kg
Lab Code: K1003360-029 **Basis:** Wet
Extraction Method: EPA 3541 **Level:** Low
Analysis Method: CAS SOC-PESTMS2

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.94	0.26	1	05/07/10	05/22/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.47	0.17	1	05/07/10	05/22/10	KWG1004738	
beta-BHC	ND	U	0.94	0.40	1	05/07/10	05/22/10	KWG1004738	*
delta-BHC	ND	U	0.94	0.28	1	05/07/10	05/22/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.4	0.70	1	05/07/10	05/22/10	KWG1004738	
Heptachlor	ND	U	0.47	0.090	1	05/07/10	05/22/10	KWG1004738	
Chlorpyrifos	ND	U	0.47	0.13	1	05/07/10	05/22/10	KWG1004738	
Aldrin	ND	U	0.94	0.22	1	05/07/10	05/22/10	KWG1004738	
Octachlorostyrene	ND	U	0.47	0.16	1	05/07/10	05/22/10	KWG1004738	
Isodrin	ND	U	0.94	0.23	1	05/07/10	05/22/10	KWG1004738	
Oxychlordane	ND	U	2.4	0.77	1	05/07/10	05/22/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.47	0.061	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDE	ND	U	0.94	0.42	1	05/07/10	05/22/10	KWG1004738	*
gamma-Chlordane	0.46	J	0.47	0.13	1	05/07/10	05/22/10	KWG1004738	
alpha-Chlordane	0.62		0.47	0.12	1	05/07/10	05/22/10	KWG1004738	
trans-Nonachlor	1.6		0.47	0.094	1	05/07/10	05/22/10	KWG1004738	
Endosulfan I	ND	U	0.94	0.42	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDE	8.4		2.4	0.70	1	05/07/10	05/22/10	KWG1004738	*
2,4'-DDD	ND	U	0.94	0.31	1	05/07/10	05/22/10	KWG1004738	*
Dieldrin	0.42	J	0.94	0.22	1	05/07/10	05/22/10	KWG1004738	
Endrin	ND	U	0.94	0.45	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDT	ND	U	0.94	0.46	1	05/07/10	05/22/10	KWG1004738	*
cis-Nonachlor	0.63		0.47	0.13	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDD	2.1		0.94	0.13	1	05/07/10	05/22/10	KWG1004738	
Endosulfan II	1.3		0.94	0.35	1	05/07/10	05/22/10	KWG1004738	
Endrin Aldehyde	ND	U	0.94	0.56	1	05/07/10	05/22/10	KWG1004738	*
4,4'-DDT	0.76	J	0.94	0.35	1	05/07/10	05/22/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.94	0.22	1	05/07/10	05/22/10	KWG1004738	*
Methoxychlor	ND	U	0.47	0.15	1	05/07/10	05/22/10	KWG1004738	
Endrin Ketone	ND	U	0.47	0.16	1	05/07/10	05/22/10	KWG1004738	
Mirex	0.19	J	0.47	0.11	1	05/07/10	05/22/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB006-BR-06 **Units:** ug/Kg
Lab Code: K1003360-029 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	80	5-124	05/22/10	Acceptable
S_HXCBZ13C6	43	5-120	05/22/10	Acceptable
S_Heptachlor-13C10	121	5-128	05/22/10	Acceptable
S_Chlorpyrifos-d10	76	5-120	05/22/10	Acceptable
S_Aldrin-13C12	75	6-113	05/22/10	Acceptable
S_Ocstyrene13C8	76	5-120	05/22/10	Acceptable
S_Isodrin-13C12	93	5-120	05/22/10	Acceptable
S_Oxychlordane-13C10	81	5-144	05/22/10	Acceptable
S_Heptachlrepx13C10	66	8-146	05/22/10	Acceptable
S_Endrin-13C12	76	20-157	05/22/10	Acceptable
S_4,4'DDD-d4	68	5-120	05/22/10	Acceptable
S_4,4'-DDT-d4	65	13-200	05/22/10	Acceptable
S_Mxchlord14	76	8-200	05/22/10	Acceptable
S_Endrinket13C12	59	5-120	05/22/10	Acceptable
S_Mirex-13C10	50	5-138	05/22/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue **Service Request:** K1003360
Date Collected: 08/11/2008 **Date Received:** 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB007-BR-07 **Units:** ug/Kg
Lab Code: K1003360-030 **Basis:** Wet
Extraction Method: EPA 3541 **Level:** Low
Analysis Method: CAS SOC-PESTMS2

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.89	0.26	1	05/07/10	05/22/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.45	0.17	1	05/07/10	05/22/10	KWG1004738	
beta-BHC	ND	U	0.89	0.40	1	05/07/10	05/22/10	KWG1004738	*
delta-BHC	ND	U	0.89	0.28	1	05/07/10	05/22/10	KWG1004738	*
Hexachlorobenzene	0.74	J	2.3	0.70	1	05/07/10	05/22/10	KWG1004738	
Heptachlor	ND	U	0.45	0.090	1	05/07/10	05/22/10	KWG1004738	
Chlorpyrifos	ND	U	0.45	0.13	1	05/07/10	05/22/10	KWG1004738	
Aldrin	ND	U	0.89	0.22	1	05/07/10	05/22/10	KWG1004738	
Octachlorostyrene	ND	U	0.45	0.16	1	05/07/10	05/22/10	KWG1004738	
Isodrin	ND	U	0.89	0.23	1	05/07/10	05/22/10	KWG1004738	
Oxychlordane	ND	U	2.3	0.77	1	05/07/10	05/22/10	KWG1004738	
Heptachlor Epoxide	0.14	J	0.45	0.061	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDE	ND	U	0.89	0.42	1	05/07/10	05/22/10	KWG1004738	*
gamma-Chlordane	0.71		0.45	0.13	1	05/07/10	05/22/10	KWG1004738	
alpha-Chlordane	1.0		0.45	0.12	1	05/07/10	05/22/10	KWG1004738	
trans-Nonachlor	3.4		0.45	0.094	1	05/07/10	05/22/10	KWG1004738	
Endosulfan I	ND	U	0.89	0.42	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDE	17		2.3	0.70	1	05/07/10	05/22/10	KWG1004738	*
2,4'-DDD	ND	U	0.89	0.31	1	05/07/10	05/22/10	KWG1004738	*
Dieldrin	0.56	J	0.89	0.22	1	05/07/10	05/22/10	KWG1004738	
Endrin	ND	U	0.89	0.45	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDT	ND	U	0.89	0.46	1	05/07/10	05/22/10	KWG1004738	*
cis-Nonachlor	1.2		0.45	0.13	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDD	2.9		0.89	0.13	1	05/07/10	05/22/10	KWG1004738	
Endosulfan II	3.3		0.89	0.35	1	05/07/10	05/22/10	KWG1004738	
Endrin Aldehyde	ND	U	0.89	0.56	1	05/07/10	05/22/10	KWG1004738	*
4,4'-DDT	0.53	J	0.89	0.35	1	05/07/10	05/22/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.89	0.22	1	05/07/10	05/22/10	KWG1004738	*
Methoxychlor	ND	U	0.45	0.15	1	05/07/10	05/22/10	KWG1004738	
Endrin Ketone	ND	U	0.45	0.16	1	05/07/10	05/22/10	KWG1004738	
Mirex	0.25	J	0.45	0.11	1	05/07/10	05/22/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB007-BR-07 **Units:** ug/Kg
Lab Code: K1003360-030 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	86	5-124	05/22/10	Acceptable
S_HXCBZ13C6	44	5-120	05/22/10	Acceptable
S_Heptachlor-13C10	130	5-128	05/22/10	Outside Control Limits
S_Chlorpyrifos-d10	80	5-120	05/22/10	Acceptable
S_Aldrin-13C12	77	6-113	05/22/10	Acceptable
S_Ocstyrene13C8	79	5-120	05/22/10	Acceptable
S_Isodrin-13C12	97	5-120	05/22/10	Acceptable
S_Oxychlordane-13C10	85	5-144	05/22/10	Acceptable
S_Heptachlrepx13C10	71	8-146	05/22/10	Acceptable
S_Endrin-13C12	76	20-157	05/22/10	Acceptable
S_4,4'DDD-d4	73	5-120	05/22/10	Acceptable
S_4,4'-DDT-d4	70	13-200	05/22/10	Acceptable
S_Mxchlord14	80	8-200	05/22/10	Acceptable
S_Endrinket13C12	62	5-120	05/22/10	Acceptable
S_Mirex-13C10	52	5-138	05/22/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-08-SB008-BR-08	Units:	ug/Kg
Lab Code:	K1003360-031	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.88	0.26	1	05/07/10	05/22/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.44	0.17	1	05/07/10	05/22/10	KWG1004738	
beta-BHC	ND	U	0.88	0.40	1	05/07/10	05/22/10	KWG1004738	*
delta-BHC	ND	U	0.88	0.28	1	05/07/10	05/22/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.2	0.70	1	05/07/10	05/22/10	KWG1004738	
Heptachlor	ND	U	0.44	0.090	1	05/07/10	05/22/10	KWG1004738	
Chlorpyrifos	ND	U	0.44	0.13	1	05/07/10	05/22/10	KWG1004738	
Aldrin	ND	U	0.88	0.22	1	05/07/10	05/22/10	KWG1004738	
Octachlorostyrene	ND	U	0.44	0.16	1	05/07/10	05/22/10	KWG1004738	
Isodrin	ND	U	0.88	0.23	1	05/07/10	05/22/10	KWG1004738	
Oxychlordane	ND	U	2.2	0.77	1	05/07/10	05/22/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.44	0.061	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDE	ND	U	0.88	0.42	1	05/07/10	05/22/10	KWG1004738	*
gamma-Chlordane	0.57		0.44	0.13	1	05/07/10	05/22/10	KWG1004738	
alpha-Chlordane	1.3		0.44	0.12	1	05/07/10	05/22/10	KWG1004738	
trans-Nonachlor	9.0		0.44	0.094	1	05/07/10	05/22/10	KWG1004738	
Endosulfan I	ND	U	0.88	0.42	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDE	49		2.2	0.70	1	05/07/10	05/26/10	KWG1004738	*
2,4'-DDD	ND	U	0.88	0.31	1	05/07/10	05/22/10	KWG1004738	*
Dieldrin	0.47	J	0.88	0.22	1	05/07/10	05/22/10	KWG1004738	
Endrin	ND	U	0.88	0.45	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDT	ND	U	0.88	0.46	1	05/07/10	05/22/10	KWG1004738	*
cis-Nonachlor	2.8		0.44	0.13	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDD	4.8		0.88	0.13	1	05/07/10	05/22/10	KWG1004738	
Endosulfan II	13		0.88	0.35	1	05/07/10	05/22/10	KWG1004738	
Endrin Aldehyde	ND	U	0.88	0.56	1	05/07/10	05/22/10	KWG1004738	*
4,4'-DDT	0.53	J	0.88	0.35	1	05/07/10	05/22/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.88	0.22	1	05/07/10	05/22/10	KWG1004738	*
Methoxychlor	ND	U	0.44	0.15	1	05/07/10	05/22/10	KWG1004738	
Endrin Ketone	ND	U	0.44	0.16	1	05/07/10	05/22/10	KWG1004738	
Mirex	0.76		0.44	0.11	1	05/07/10	05/22/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB008-BR-08 **Units:** ug/Kg
Lab Code: K1003360-031 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	82	5-124	05/22/10	Acceptable
S_HXCBZ13C6	44	5-120	05/22/10	Acceptable
S_Heptachlor-13C10	131	5-128	05/22/10	Outside Control Limits
S_Chlorpyrifos-d10	81	5-120	05/22/10	Acceptable
S_Aldrin-13C12	77	6-113	05/22/10	Acceptable
S_Ocstyrene13C8	80	5-120	05/22/10	Acceptable
S_Isodrin-13C12	94	5-120	05/22/10	Acceptable
S_Oxychlordane-13C10	89	5-144	05/22/10	Acceptable
S_Heptachlrepx13C10	74	8-146	05/22/10	Acceptable
S_Endrin-13C12	75	20-157	05/22/10	Acceptable
S_4,4'DDD-d4	72	5-120	05/22/10	Acceptable
S_4,4'-DDT-d4	75	13-200	05/22/10	Acceptable
S_Mxchlord14	82	8-200	05/22/10	Acceptable
S_Endrinket13C12	61	5-120	05/22/10	Acceptable
S_Mirex-13C10	53	5-138	05/22/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB009-BR-09
Lab Code: K1003360-032

Units: ug/Kg
Basis: Wet

Extraction Method: EPA 3541
Analysis Method: CAS SOC-PESTMS2

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.82	0.26	1	05/07/10	05/22/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.41	0.17	1	05/07/10	05/22/10	KWG1004738	
beta-BHC	ND	U	0.82	0.40	1	05/07/10	05/22/10	KWG1004738	*
delta-BHC	ND	U	0.82	0.28	1	05/07/10	05/22/10	KWG1004738	*
Hexachlorobenzene	ND	U	2.1	0.70	1	05/07/10	05/22/10	KWG1004738	
Heptachlor	ND	U	0.41	0.090	1	05/07/10	05/22/10	KWG1004738	
Chlorpyrifos	ND	U	0.41	0.13	1	05/07/10	05/22/10	KWG1004738	
Aldrin	ND	U	0.82	0.22	1	05/07/10	05/22/10	KWG1004738	
Octachlorostyrene	ND	U	0.41	0.16	1	05/07/10	05/22/10	KWG1004738	
Isodrin	ND	U	0.82	0.23	1	05/07/10	05/22/10	KWG1004738	
Oxychlordane	ND	U	2.1	0.77	1	05/07/10	05/22/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.41	0.061	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDE	ND	U	0.82	0.42	1	05/07/10	05/22/10	KWG1004738	*
gamma-Chlordane	0.36	J	0.41	0.13	1	05/07/10	05/22/10	KWG1004738	
alpha-Chlordane	0.60		0.41	0.12	1	05/07/10	05/22/10	KWG1004738	
trans-Nonachlor	2.6		0.41	0.094	1	05/07/10	05/22/10	KWG1004738	
Endosulfan I	ND	U	0.82	0.42	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDE	11		2.1	0.70	1	05/07/10	05/22/10	KWG1004738	*
2,4'-DDD	ND	U	0.82	0.31	1	05/07/10	05/22/10	KWG1004738	*
Dieldrin	0.30	J	0.82	0.22	1	05/07/10	05/22/10	KWG1004738	
Endrin	ND	U	0.82	0.45	1	05/07/10	05/22/10	KWG1004738	
2,4'-DDT	ND	U	0.82	0.46	1	05/07/10	05/22/10	KWG1004738	*
cis-Nonachlor	0.83		0.41	0.13	1	05/07/10	05/22/10	KWG1004738	
4,4'-DDD	1.9		0.82	0.13	1	05/07/10	05/22/10	KWG1004738	
Endosulfan II	3.0		0.82	0.35	1	05/07/10	05/22/10	KWG1004738	
Endrin Aldehyde	ND	U	0.82	0.56	1	05/07/10	05/22/10	KWG1004738	*
4,4'-DDT	0.50	J	0.82	0.35	1	05/07/10	05/22/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.82	0.22	1	05/07/10	05/22/10	KWG1004738	*
Methoxychlor	ND	U	0.41	0.15	1	05/07/10	05/22/10	KWG1004738	
Endrin Ketone	ND	U	0.41	0.16	1	05/07/10	05/22/10	KWG1004738	
Mirex	0.16	J	0.41	0.11	1	05/07/10	05/22/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB009-BR-09 **Units:** ug/Kg
Lab Code: K1003360-032 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	78	5-124	05/22/10	Acceptable
S_HXCBZ13C6	39	5-120	05/22/10	Acceptable
S_Heptachlor-13C10	111	5-128	05/22/10	Acceptable
S_Chlorpyrifos-d10	71	5-120	05/22/10	Acceptable
S_Aldrin-13C12	76	6-113	05/22/10	Acceptable
S_Ocstyrene13C8	72	5-120	05/22/10	Acceptable
S_Isodrin-13C12	88	5-120	05/22/10	Acceptable
S_Oxychlordane-13C10	74	5-144	05/22/10	Acceptable
S_Heptachlrepxo13C10	63	8-146	05/22/10	Acceptable
S_Endrin-13C12	69	20-157	05/22/10	Acceptable
S_4,4'DDD-d4	65	5-120	05/22/10	Acceptable
S_4,4'-DDT-d4	62	13-200	05/22/10	Acceptable
S_Mxchlord14	72	8-200	05/22/10	Acceptable
S_Endrinket13C12	55	5-120	05/22/10	Acceptable
S_Mirex-13C10	47	5-138	05/22/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	08/11/2008
Sample Matrix:	Animal tissue	Date Received:	08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-08-SB012-BR-10	Units:	ug/Kg
Lab Code:	K1003360-033	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	0.31 J	0.89	0.26	1	05/06/10	05/24/10	KWG1004753	
gamma-BHC (Lindane)	ND U	0.45	0.17	1	05/06/10	05/24/10	KWG1004753	
beta-BHC	ND U	0.89	0.40	1	05/06/10	05/24/10	KWG1004753	*
delta-BHC	ND U	0.89	0.28	1	05/06/10	05/24/10	KWG1004753	*
Hexachlorobenzene	1.2 J	2.3	0.70	1	05/06/10	05/24/10	KWG1004753	*
Heptachlor	ND U	0.45	0.090	1	05/06/10	05/24/10	KWG1004753	
Chlorpyrifos	ND U	0.45	0.13	1	05/06/10	05/24/10	KWG1004753	*
Aldrin	ND U	0.89	0.22	1	05/06/10	05/24/10	KWG1004753	
Octachlorostyrene	ND U	0.45	0.16	1	05/06/10	05/24/10	KWG1004753	
Isodrin	ND U	0.89	0.23	1	05/06/10	05/24/10	KWG1004753	
Oxychlordane	ND U	2.3	0.77	1	05/06/10	05/24/10	KWG1004753	
Heptachlor Epoxide	ND U	0.45	0.061	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDE	ND U	0.89	0.42	1	05/06/10	05/24/10	KWG1004753	*
gamma-Chlordane	0.72	0.45	0.13	1	05/06/10	05/24/10	KWG1004753	
alpha-Chlordane	1.2	0.45	0.12	1	05/06/10	05/24/10	KWG1004753	
trans-Nonachlor	3.9	0.45	0.094	1	05/06/10	05/24/10	KWG1004753	
Endosulfan I	ND U	0.89	0.42	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDE	21	2.3	0.70	1	05/06/10	05/24/10	KWG1004753	*
2,4'-DDD	ND U	0.89	0.31	1	05/06/10	05/24/10	KWG1004753	*
Dieldrin	0.42 J	0.89	0.22	1	05/06/10	05/24/10	KWG1004753	
Endrin	ND U	0.89	0.45	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDT	ND U	0.89	0.46	1	05/06/10	05/24/10	KWG1004753	*
cis-Nonachlor	1.3	0.45	0.13	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDD	5.1	0.89	0.13	1	05/06/10	05/24/10	KWG1004753	
Endosulfan II	ND U	0.89	0.35	1	05/06/10	05/24/10	KWG1004753	
Endrin Aldehyde	ND U	0.89	0.56	1	05/06/10	05/24/10	KWG1004753	*
4,4'-DDT	1.2	0.89	0.35	1	05/06/10	05/24/10	KWG1004753	
Endosulfan Sulfate	ND U	0.89	0.22	1	05/06/10	05/24/10	KWG1004753	*
Methoxychlor	ND U	0.45	0.15	1	05/06/10	05/24/10	KWG1004753	
Endrin Ketone	ND U	0.45	0.16	1	05/06/10	05/24/10	KWG1004753	
Mirex	0.33 J	0.45	0.11	1	05/06/10	05/24/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB012-BR-10 **Units:** ug/Kg
Lab Code: K1003360-033 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	102	5-124	05/24/10	Acceptable
S_HXCBZ13C6	93	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	122	5-128	05/24/10	Acceptable
S_Chlorpyrifos-d10	87	5-120	05/24/10	Acceptable
S_Aldrin-13C12	94	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	88	5-120	05/24/10	Acceptable
S_Isodrin-13C12	107	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	100	5-144	05/24/10	Acceptable
S_Heptachlrepx13C10	72	8-146	05/24/10	Acceptable
S_Endrin-13C12	84	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	77	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	93	13-200	05/24/10	Acceptable
S_Mxchlord14	91	8-200	05/24/10	Acceptable
S_Endrinket13C12	69	5-120	05/24/10	Acceptable
S_Mirex-13C10	64	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	08/11/2008
Sample Matrix:	Animal tissue	Date Received:	08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-08-SB011-BR-11	Units:	ug/Kg
Lab Code:	K1003360-034	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.89	0.26	1	05/06/10	05/24/10	KWG1004753	
gamma-BHC (Lindane)	ND	U	0.45	0.17	1	05/06/10	05/24/10	KWG1004753	
beta-BHC	ND	U	0.89	0.40	1	05/06/10	05/24/10	KWG1004753	*
delta-BHC	ND	U	0.89	0.28	1	05/06/10	05/24/10	KWG1004753	*
Hexachlorobenzene	0.96	J	2.3	0.70	1	05/06/10	05/24/10	KWG1004753	*
Heptachlor	ND	U	0.45	0.090	1	05/06/10	05/24/10	KWG1004753	
Chlorpyrifos	ND	U	0.45	0.13	1	05/06/10	05/24/10	KWG1004753	*
Aldrin	ND	U	0.89	0.22	1	05/06/10	05/24/10	KWG1004753	
Octachlorostyrene	ND	U	0.45	0.16	1	05/06/10	05/24/10	KWG1004753	
Isodrin	ND	U	0.89	0.23	1	05/06/10	05/24/10	KWG1004753	
Oxychlordane	ND	U	2.3	0.77	1	05/06/10	05/24/10	KWG1004753	
Heptachlor Epoxide	ND	U	0.45	0.061	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDE	ND	U	0.89	0.42	1	05/06/10	05/24/10	KWG1004753	*
gamma-Chlordane	0.79		0.45	0.13	1	05/06/10	05/24/10	KWG1004753	
alpha-Chlordane	1.4		0.45	0.12	1	05/06/10	05/24/10	KWG1004753	
trans-Nonachlor	5.3		0.45	0.094	1	05/06/10	05/24/10	KWG1004753	
Endosulfan I	ND	U	0.89	0.42	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDE	30		2.3	0.70	1	05/06/10	05/24/10	KWG1004753	*
2,4'-DDD	ND	U	0.89	0.31	1	05/06/10	05/24/10	KWG1004753	*
Dieldrin	0.66	J	0.89	0.22	1	05/06/10	05/24/10	KWG1004753	
Endrin	ND	U	0.89	0.45	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDT	ND	U	0.89	0.46	1	05/06/10	05/24/10	KWG1004753	*
cis-Nonachlor	1.8		0.45	0.13	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDD	3.7		0.89	0.13	1	05/06/10	05/24/10	KWG1004753	
Endosulfan II	ND	U	0.89	0.35	1	05/06/10	05/24/10	KWG1004753	
Endrin Aldehyde	ND	U	0.89	0.56	1	05/06/10	05/24/10	KWG1004753	*
4,4'-DDT	1.2		0.89	0.35	1	05/06/10	05/24/10	KWG1004753	
Endosulfan Sulfate	ND	U	0.89	0.22	1	05/06/10	05/24/10	KWG1004753	*
Methoxychlor	ND	U	0.45	0.15	1	05/06/10	05/24/10	KWG1004753	
Endrin Ketone	ND	U	0.45	0.16	1	05/06/10	05/24/10	KWG1004753	
Mirex	0.39	J	0.45	0.11	1	05/06/10	05/24/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB011-BR-11 **Units:** ug/Kg
Lab Code: K1003360-034 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	97	5-124	05/24/10	Acceptable
S_HXCBZ13C6	88	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	122	5-128	05/24/10	Acceptable
S_Chlorpyrifos-d10	92	5-120	05/24/10	Acceptable
S_Aldrin-13C12	93	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	91	5-120	05/24/10	Acceptable
S_Isodrin-13C12	112	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	116	5-144	05/24/10	Acceptable
S_Heptachlrepx13C10	77	8-146	05/24/10	Acceptable
S_Endrin-13C12	94	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	85	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	93	13-200	05/24/10	Acceptable
S_Mxchlord14	92	8-200	05/24/10	Acceptable
S_Endrinket13C12	73	5-120	05/24/10	Acceptable
S_Mirex-13C10	64	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-08-SB013-BR-13	Units: ug/Kg
Lab Code:	K1003360-035	Basis: Wet
Extraction Method:	EPA 3541	Level: Low
Analysis Method:	CAS SOC-PESTMS2	

Analyte Name	Result Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	0.58 J	0.94	0.26	1	05/06/10	05/24/10	KWG1004753	
gamma-BHC (Lindane)	ND U	0.47	0.17	1	05/06/10	05/24/10	KWG1004753	
beta-BHC	ND U	0.94	0.40	1	05/06/10	05/24/10	KWG1004753	*
delta-BHC	ND U	0.94	0.28	1	05/06/10	05/24/10	KWG1004753	*
Hexachlorobenzene	1.7 J	2.4	0.70	1	05/06/10	05/24/10	KWG1004753	*
Heptachlor	ND U	0.47	0.090	1	05/06/10	05/24/10	KWG1004753	
Chlorpyrifos	ND U	0.47	0.13	1	05/06/10	05/24/10	KWG1004753	*
Aldrin	ND U	0.94	0.22	1	05/06/10	05/24/10	KWG1004753	
Octachlorostyrene	ND U	0.47	0.16	1	05/06/10	05/24/10	KWG1004753	
Isodrin	ND U	0.94	0.23	1	05/06/10	05/24/10	KWG1004753	
Oxychlordane	ND U	2.4	0.77	1	05/06/10	05/24/10	KWG1004753	
Heptachlor Epoxide	ND U	0.47	0.061	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDE	ND U	0.94	0.42	1	05/06/10	05/24/10	KWG1004753	*
gamma-Chlordane	0.38 J	0.47	0.13	1	05/06/10	05/24/10	KWG1004753	
alpha-Chlordane	0.66	0.47	0.12	1	05/06/10	05/24/10	KWG1004753	
trans-Nonachlor	2.6	0.47	0.094	1	05/06/10	05/24/10	KWG1004753	
Endosulfan I	ND U	0.94	0.42	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDE	16	2.4	0.70	1	05/06/10	05/24/10	KWG1004753	*
2,4'-DDD	ND U	0.94	0.31	1	05/06/10	05/24/10	KWG1004753	*
Dieldrin	ND U	0.94	0.22	1	05/06/10	05/24/10	KWG1004753	
Endrin	ND U	0.94	0.45	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDT	ND U	0.94	0.46	1	05/06/10	05/24/10	KWG1004753	*
cis-Nonachlor	1.0	0.47	0.13	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDD	5.6	0.94	0.13	1	05/06/10	05/24/10	KWG1004753	
Endosulfan II	ND U	0.94	0.35	1	05/06/10	05/24/10	KWG1004753	
Endrin Aldehyde	ND U	0.94	0.56	1	05/06/10	05/24/10	KWG1004753	*
4,4'-DDT	1.0	0.94	0.35	1	05/06/10	05/24/10	KWG1004753	
Endosulfan Sulfate	ND U	0.94	0.22	1	05/06/10	05/24/10	KWG1004753	*
Methoxychlor	ND U	0.47	0.15	1	05/06/10	05/24/10	KWG1004753	
Endrin Ketone	ND U	0.47	0.16	1	05/06/10	05/24/10	KWG1004753	
Mirex	0.32 J	0.47	0.11	1	05/06/10	05/24/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/11/2008
Date Received: 08/21/2009

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-08-SB013-BR-13 **Units:** ug/Kg
Lab Code: K1003360-035 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	90	5-124	05/24/10	Acceptable
S_HXCBZ13C6	44	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	95	5-128	05/24/10	Acceptable
S_Chlorpyrifos-d10	83	5-120	05/24/10	Acceptable
S_Aldrin-13C12	81	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	86	5-120	05/24/10	Acceptable
S_Isodrin-13C12	87	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	104	5-144	05/24/10	Acceptable
S_Heptachlrepx13C10	66	8-146	05/24/10	Acceptable
S_Endrin-13C12	88	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	74	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	82	13-200	05/24/10	Acceptable
S_Mxchlord14	84	8-200	05/24/10	Acceptable
S_Endrinket13C12	72	5-120	05/24/10	Acceptable
S_Mirex-13C10	58	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 07/29/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-B06-BC-01-COMP2	Units:	ug/Kg
Lab Code:	K1003360-036	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.87	0.26	1	05/06/10	05/24/10	KWG1004753	
gamma-BHC (Lindane)	ND	U	0.44	0.17	1	05/06/10	05/24/10	KWG1004753	
beta-BHC	ND	U	0.87	0.40	1	05/06/10	05/24/10	KWG1004753	*
delta-BHC	ND	U	0.87	0.28	1	05/06/10	05/24/10	KWG1004753	*
Hexachlorobenzene	ND	U	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
Heptachlor	ND	U	0.44	0.090	1	05/06/10	05/24/10	KWG1004753	
Chlorpyrifos	ND	U	0.44	0.13	1	05/06/10	05/24/10	KWG1004753	*
Aldrin	ND	U	0.87	0.22	1	05/06/10	05/24/10	KWG1004753	
Octachlorostyrene	ND	U	0.44	0.16	1	05/06/10	05/24/10	KWG1004753	
Isodrin	ND	U	0.87	0.23	1	05/06/10	05/24/10	KWG1004753	
Oxychlordane	ND	U	2.2	0.77	1	05/06/10	05/24/10	KWG1004753	
Heptachlor Epoxide	ND	U	0.44	0.061	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDE	ND	U	0.87	0.42	1	05/06/10	05/24/10	KWG1004753	*
gamma-Chlordane	0.28	J	0.44	0.13	1	05/06/10	05/24/10	KWG1004753	
alpha-Chlordane	0.25	J	0.44	0.12	1	05/06/10	05/24/10	KWG1004753	
trans-Nonachlor	0.15	J	0.44	0.094	1	05/06/10	05/24/10	KWG1004753	
Endosulfan I	ND	U	0.87	0.42	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDE	ND	U	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
2,4'-DDD	ND	U	0.87	0.31	1	05/06/10	05/24/10	KWG1004753	*
Dieldrin	ND	U	0.87	0.22	1	05/06/10	05/24/10	KWG1004753	
Endrin	ND	U	0.87	0.45	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDT	ND	U	0.87	0.46	1	05/06/10	05/24/10	KWG1004753	*
cis-Nonachlor	ND	U	0.44	0.13	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDD	0.48	J	0.87	0.13	1	05/06/10	05/24/10	KWG1004753	
Endosulfan II	ND	U	0.87	0.35	1	05/06/10	05/24/10	KWG1004753	
Endrin Aldehyde	ND	U	0.87	0.56	1	05/06/10	05/24/10	KWG1004753	*
4,4'-DDT	ND	U	0.87	0.35	1	05/06/10	05/24/10	KWG1004753	
Endosulfan Sulfate	ND	U	0.87	0.22	1	05/06/10	05/24/10	KWG1004753	*
Methoxychlor	ND	U	0.44	0.15	1	05/06/10	05/24/10	KWG1004753	
Endrin Ketone	ND	U	0.44	0.16	1	05/06/10	05/24/10	KWG1004753	
Mirex	ND	U	0.44	0.11	1	05/06/10	05/24/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 07/29/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-B06-BC-01-COMP2 **Units:** ug/Kg
Lab Code: K1003360-036 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	84	5-124	05/24/10	Acceptable
S_HXCBZ13C6	77	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	131	5-128	05/24/10	Outside Control Limits
S_Chlorpyrifos-d10	80	5-120	05/24/10	Acceptable
S_Aldrin-13C12	76	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	81	5-120	05/24/10	Acceptable
S_Isodrin-13C12	80	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	81	5-144	05/24/10	Acceptable
S_Heptachlrepx13C10	71	8-146	05/24/10	Acceptable
S_Endrin-13C12	74	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	74	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	69	13-200	05/24/10	Acceptable
S_Mxchlord14	78	8-200	05/24/10	Acceptable
S_Endrinket13C12	63	5-120	05/24/10	Acceptable
S_Mirex-13C10	55	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 07/30/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-B03-BC-03-COMP1	Units:	ug/Kg
Lab Code:	K1003360-037	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.87	0.26	1	05/06/10	05/24/10	KWG1004753	
gamma-BHC (Lindane)	ND	U	0.44	0.17	1	05/06/10	05/24/10	KWG1004753	
beta-BHC	ND	U	0.87	0.40	1	05/06/10	05/24/10	KWG1004753	*
delta-BHC	ND	U	0.87	0.28	1	05/06/10	05/24/10	KWG1004753	*
Hexachlorobenzene	0.77	J	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
Heptachlor	ND	U	0.44	0.090	1	05/06/10	05/24/10	KWG1004753	
Chlorpyrifos	ND	U	0.44	0.13	1	05/06/10	05/24/10	KWG1004753	*
Aldrin	ND	U	0.87	0.22	1	05/06/10	05/24/10	KWG1004753	
Octachlorostyrene	ND	U	0.44	0.16	1	05/06/10	05/24/10	KWG1004753	
Isodrin	ND	U	0.87	0.23	1	05/06/10	05/24/10	KWG1004753	
Oxychlordane	ND	U	2.2	0.77	1	05/06/10	05/24/10	KWG1004753	
Heptachlor Epoxide	ND	U	0.44	0.061	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDE	ND	U	0.87	0.42	1	05/06/10	05/24/10	KWG1004753	*
gamma-Chlordane	ND	U	0.44	0.13	1	05/06/10	05/24/10	KWG1004753	
alpha-Chlordane	ND	U	0.44	0.12	1	05/06/10	05/24/10	KWG1004753	
trans-Nonachlor	ND	U	0.44	0.094	1	05/06/10	05/24/10	KWG1004753	
Endosulfan I	ND	U	0.87	0.42	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDE	ND	U	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
2,4'-DDD	ND	U	0.87	0.31	1	05/06/10	05/24/10	KWG1004753	*
Dieldrin	ND	U	0.87	0.22	1	05/06/10	05/24/10	KWG1004753	
Endrin	ND	U	0.87	0.45	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDT	ND	U	0.87	0.46	1	05/06/10	05/24/10	KWG1004753	*
cis-Nonachlor	ND	U	0.44	0.13	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDD	0.55	J	0.87	0.13	1	05/06/10	05/24/10	KWG1004753	
Endosulfan II	ND	U	0.87	0.35	1	05/06/10	05/24/10	KWG1004753	
Endrin Aldehyde	ND	U	0.87	0.56	1	05/06/10	05/24/10	KWG1004753	*
4,4'-DDT	ND	U	0.87	0.35	1	05/06/10	05/24/10	KWG1004753	
Endosulfan Sulfate	ND	U	0.87	0.22	1	05/06/10	05/24/10	KWG1004753	*
Methoxychlor	ND	U	0.44	0.15	1	05/06/10	05/24/10	KWG1004753	
Endrin Ketone	ND	U	0.44	0.16	1	05/06/10	05/24/10	KWG1004753	
Mirex	ND	U	0.44	0.11	1	05/06/10	05/24/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 07/30/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-B03-BC-03-COMP1 **Units:** ug/Kg
Lab Code: K1003360-037 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	89	5-124	05/24/10	Acceptable
S_HXCBZ13C6	81	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	123	5-128	05/24/10	Acceptable
S_Chlorpyrifos-d10	85	5-120	05/24/10	Acceptable
S_Aldrin-13C12	78	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	90	5-120	05/24/10	Acceptable
S_Isodrin-13C12	105	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	95	5-144	05/24/10	Acceptable
S_Heptachlrepx13C10	66	8-146	05/24/10	Acceptable
S_Endrin-13C12	92	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	75	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	78	13-200	05/24/10	Acceptable
S_Mxchlord14	85	8-200	05/24/10	Acceptable
S_Endrinket13C12	66	5-120	05/24/10	Acceptable
S_Mirex-13C10	59	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 07/31/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-B08-BC-01-COMP2 **Units:** ug/Kg
Lab Code: K1003360-038 **Basis:** Wet
Extraction Method: EPA 3541 **Level:** Low
Analysis Method: CAS SOC-PESTMS2

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.85	0.26	1	05/06/10	05/24/10	KWG1004753	
gamma-BHC (Lindane)	ND	U	0.43	0.17	1	05/06/10	05/24/10	KWG1004753	
beta-BHC	ND	U	0.85	0.40	1	05/06/10	05/24/10	KWG1004753	*
delta-BHC	ND	U	0.85	0.28	1	05/06/10	05/24/10	KWG1004753	*
Hexachlorobenzene	0.77	J	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
Heptachlor	ND	U	0.43	0.090	1	05/06/10	05/24/10	KWG1004753	
Chlorpyrifos	ND	U	0.43	0.13	1	05/06/10	05/24/10	KWG1004753	*
Aldrin	ND	U	0.85	0.22	1	05/06/10	05/24/10	KWG1004753	
Octachlorostyrene	ND	U	0.43	0.16	1	05/06/10	05/24/10	KWG1004753	
Isodrin	ND	U	0.85	0.23	1	05/06/10	05/24/10	KWG1004753	
Oxychlordane	ND	U	2.2	0.77	1	05/06/10	05/24/10	KWG1004753	
Heptachlor Epoxide	ND	U	0.43	0.061	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDE	ND	U	0.85	0.42	1	05/06/10	05/24/10	KWG1004753	*
gamma-Chlordane	ND	U	0.43	0.13	1	05/06/10	05/24/10	KWG1004753	
alpha-Chlordane	ND	U	0.43	0.12	1	05/06/10	05/24/10	KWG1004753	
trans-Nonachlor	ND	U	0.43	0.094	1	05/06/10	05/24/10	KWG1004753	
Endosulfan I	ND	U	0.85	0.42	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDE	ND	U	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
2,4'-DDD	ND	U	0.85	0.31	1	05/06/10	05/24/10	KWG1004753	*
Dieldrin	ND	U	0.85	0.22	1	05/06/10	05/24/10	KWG1004753	
Endrin	ND	U	0.85	0.45	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDT	ND	U	0.85	0.46	1	05/06/10	05/24/10	KWG1004753	*
cis-Nonachlor	ND	U	0.43	0.13	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDD	ND	U	0.85	0.13	1	05/06/10	05/24/10	KWG1004753	
Endosulfan II	ND	U	0.85	0.35	1	05/06/10	05/24/10	KWG1004753	
Endrin Aldehyde	ND	U	0.85	0.56	1	05/06/10	05/24/10	KWG1004753	*
4,4'-DDT	ND	U	0.85	0.35	1	05/06/10	05/24/10	KWG1004753	
Endosulfan Sulfate	ND	U	0.85	0.22	1	05/06/10	05/24/10	KWG1004753	*
Methoxychlor	ND	U	0.43	0.15	1	05/06/10	05/24/10	KWG1004753	
Endrin Ketone	ND	U	0.43	0.16	1	05/06/10	05/24/10	KWG1004753	
Mirex	ND	U	0.43	0.11	1	05/06/10	05/24/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 07/31/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-B08-BC-01-COMP2 **Units:** ug/Kg
Lab Code: K1003360-038 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	89	5-124	05/24/10	Acceptable
S_HXCBZ13C6	83	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	147	5-128	05/24/10	Outside Control Limits
S_Chlorpyrifos-d10	83	5-120	05/24/10	Acceptable
S_Aldrin-13C12	86	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	58	5-120	05/24/10	Acceptable
S_Isodrin-13C12	59	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	86	5-144	05/24/10	Acceptable
S_Heptachlrepxo13C10	64	8-146	05/24/10	Acceptable
S_Endrin-13C12	81	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	76	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	74	13-200	05/24/10	Acceptable
S_Mxchlord14	76	8-200	05/24/10	Acceptable
S_Endrinket13C12	57	5-120	05/24/10	Acceptable
S_Mirex-13C10	56	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 07/31/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-B08-CN-02-COMP1	Units:	ug/Kg
Lab Code:	K1003360-039	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.85	0.26	1	05/06/10	05/24/10	KWG1004753	
gamma-BHC (Lindane)	ND	U	0.43	0.17	1	05/06/10	05/24/10	KWG1004753	
beta-BHC	ND	U	0.85	0.40	1	05/06/10	05/24/10	KWG1004753	*
delta-BHC	ND	U	0.85	0.28	1	05/06/10	05/24/10	KWG1004753	*
Hexachlorobenzene	1.4	J	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
Heptachlor	ND	U	0.43	0.090	1	05/06/10	05/24/10	KWG1004753	
Chlorpyrifos	ND	U	0.43	0.13	1	05/06/10	05/24/10	KWG1004753	*
Aldrin	ND	U	0.85	0.22	1	05/06/10	05/24/10	KWG1004753	
Octachlorostyrene	ND	U	0.43	0.16	1	05/06/10	05/24/10	KWG1004753	
Isodrin	ND	U	0.85	0.23	1	05/06/10	05/24/10	KWG1004753	
Oxychlordane	ND	U	2.2	0.77	1	05/06/10	05/24/10	KWG1004753	
Heptachlor Epoxide	ND	U	0.43	0.061	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDE	ND	U	0.85	0.42	1	05/06/10	05/24/10	KWG1004753	*
gamma-Chlordane	ND	U	0.43	0.13	1	05/06/10	05/24/10	KWG1004753	
alpha-Chlordane	ND	U	0.43	0.12	1	05/06/10	05/24/10	KWG1004753	
trans-Nonachlor	ND	U	0.43	0.094	1	05/06/10	05/24/10	KWG1004753	
Endosulfan I	ND	U	0.85	0.42	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDE	ND	U	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
2,4'-DDD	ND	U	0.85	0.31	1	05/06/10	05/24/10	KWG1004753	*
Dieldrin	ND	U	0.85	0.22	1	05/06/10	05/24/10	KWG1004753	
Endrin	ND	U	0.85	0.45	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDT	ND	U	0.85	0.46	1	05/06/10	05/24/10	KWG1004753	*
cis-Nonachlor	ND	U	0.43	0.13	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDD	ND	U	0.85	0.13	1	05/06/10	05/24/10	KWG1004753	
Endosulfan II	ND	U	0.85	0.35	1	05/06/10	05/24/10	KWG1004753	
Endrin Aldehyde	ND	U	0.85	0.56	1	05/06/10	05/24/10	KWG1004753	*
4,4'-DDT	ND	U	0.85	0.35	1	05/06/10	05/24/10	KWG1004753	
Endosulfan Sulfate	ND	U	0.85	0.22	1	05/06/10	05/24/10	KWG1004753	*
Methoxychlor	ND	U	0.43	0.15	1	05/06/10	05/24/10	KWG1004753	
Endrin Ketone	ND	U	0.43	0.16	1	05/06/10	05/24/10	KWG1004753	
Mirex	ND	U	0.43	0.11	1	05/06/10	05/24/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 07/31/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-B08-CN-02-COMP1 **Units:** ug/Kg
Lab Code: K1003360-039 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	87	5-124	05/24/10	Acceptable
S_HXCBZ13C6	81	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	136	5-128	05/24/10	Outside Control Limits
S_Chlorpyrifos-d10	87	5-120	05/24/10	Acceptable
S_Aldrin-13C12	84	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	84	5-120	05/24/10	Acceptable
S_Isodrin-13C12	101	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	94	5-144	05/24/10	Acceptable
S_Heptachlrepxo13C10	73	8-146	05/24/10	Acceptable
S_Endrin-13C12	76	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	73	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	64	13-200	05/24/10	Acceptable
S_Mxchlord14	71	8-200	05/24/10	Acceptable
S_Endrinket13C12	61	5-120	05/24/10	Acceptable
S_Mirex-13C10	52	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	08/01/2008
Sample Matrix:	Animal tissue	Date Received:	04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-B09-MY-M-COMP1	Units:	ug/Kg
Lab Code:	K1003360-040	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.87	0.26	1	05/06/10	05/24/10	KWG1004753	
gamma-BHC (Lindane)	ND	U	0.44	0.17	1	05/06/10	05/24/10	KWG1004753	
beta-BHC	ND	U	0.87	0.40	1	05/06/10	05/24/10	KWG1004753	*
delta-BHC	ND	U	0.87	0.28	1	05/06/10	05/24/10	KWG1004753	*
Hexachlorobenzene	1.5	J	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
Heptachlor	ND	U	0.44	0.090	1	05/06/10	05/24/10	KWG1004753	
Chlorpyrifos	ND	U	0.44	0.13	1	05/06/10	05/24/10	KWG1004753	*
Aldrin	ND	U	0.87	0.22	1	05/06/10	05/24/10	KWG1004753	
Octachlorostyrene	ND	U	0.44	0.16	1	05/06/10	05/24/10	KWG1004753	
Isodrin	ND	U	0.87	0.23	1	05/06/10	05/24/10	KWG1004753	
Oxychlordane	ND	U	2.2	0.77	1	05/06/10	05/24/10	KWG1004753	
Heptachlor Epoxide	ND	U	0.44	0.061	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDE	ND	U	0.87	0.42	1	05/06/10	05/24/10	KWG1004753	*
gamma-Chlordane	ND	U	0.44	0.13	1	05/06/10	05/24/10	KWG1004753	
alpha-Chlordane	ND	U	0.44	0.12	1	05/06/10	05/24/10	KWG1004753	
trans-Nonachlor	ND	U	0.44	0.094	1	05/06/10	05/24/10	KWG1004753	
Endosulfan I	ND	U	0.87	0.42	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDE	ND	U	2.2	0.70	1	05/06/10	05/24/10	KWG1004753	*
2,4'-DDD	ND	U	0.87	0.31	1	05/06/10	05/24/10	KWG1004753	*
Dieldrin	ND	U	0.87	0.22	1	05/06/10	05/24/10	KWG1004753	
Endrin	ND	U	0.87	0.45	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDT	ND	U	0.87	0.46	1	05/06/10	05/24/10	KWG1004753	*
cis-Nonachlor	ND	U	0.44	0.13	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDD	0.16	J	0.87	0.13	1	05/06/10	05/24/10	KWG1004753	
Endosulfan II	ND	U	0.87	0.35	1	05/06/10	05/24/10	KWG1004753	
Endrin Aldehyde	ND	U	0.87	0.56	1	05/06/10	05/24/10	KWG1004753	*
4,4'-DDT	ND	U	0.87	0.35	1	05/06/10	05/24/10	KWG1004753	
Endosulfan Sulfate	ND	U	0.87	0.22	1	05/06/10	05/24/10	KWG1004753	*
Methoxychlor	ND	U	0.44	0.15	1	05/06/10	05/24/10	KWG1004753	
Endrin Ketone	ND	U	0.44	0.16	1	05/06/10	05/24/10	KWG1004753	
Mirex	ND	U	0.44	0.11	1	05/06/10	05/24/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/01/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-B09-MY-M-COMP1 **Units:** ug/Kg
Lab Code: K1003360-040 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	85	5-124	05/24/10	Acceptable
S_HXCBZ13C6	80	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	139	5-128	05/24/10	Outside Control Limits
S_Chlorpyrifos-d10	85	5-120	05/24/10	Acceptable
S_Aldrin-13C12	83	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	82	5-120	05/24/10	Acceptable
S_Isodrin-13C12	87	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	84	5-144	05/24/10	Acceptable
S_Heptachlrepxo13C10	74	8-146	05/24/10	Acceptable
S_Endrin-13C12	83	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	71	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	59	13-200	05/24/10	Acceptable
S_Mxchlord14	66	8-200	05/24/10	Acceptable
S_Endrinket13C12	56	5-120	05/24/10	Acceptable
S_Mirex-13C10	51	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K1003360
Project:	EW RI/FS Fish and Crab Sampling/08-08-09-41	Date Collected:	08/01/2008
Sample Matrix:	Animal tissue	Date Received:	04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-B10-BC-01-COMP2	Units:	ug/Kg
Lab Code:	K1003360-041	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.82	0.26	1	05/06/10	05/24/10	KWG1004753	
gamma-BHC (Lindane)	ND	U	0.41	0.17	1	05/06/10	05/24/10	KWG1004753	
beta-BHC	ND	U	0.82	0.40	1	05/06/10	05/24/10	KWG1004753	*
delta-BHC	ND	U	0.82	0.28	1	05/06/10	05/24/10	KWG1004753	*
Hexachlorobenzene	ND	U	2.1	0.70	1	05/06/10	05/24/10	KWG1004753	*
Heptachlor	ND	U	0.41	0.090	1	05/06/10	05/24/10	KWG1004753	
Chlorpyrifos	ND	U	0.41	0.13	1	05/06/10	05/24/10	KWG1004753	*
Aldrin	ND	U	0.82	0.22	1	05/06/10	05/24/10	KWG1004753	
Octachlorostyrene	ND	U	0.41	0.16	1	05/06/10	05/24/10	KWG1004753	
Isodrin	ND	U	0.82	0.23	1	05/06/10	05/24/10	KWG1004753	
Oxychlordane	ND	U	2.1	0.77	1	05/06/10	05/24/10	KWG1004753	
Heptachlor Epoxide	ND	U	0.41	0.061	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDE	ND	U	0.82	0.42	1	05/06/10	05/24/10	KWG1004753	*
gamma-Chlordane	0.14	J	0.41	0.13	1	05/06/10	05/24/10	KWG1004753	
alpha-Chlordane	ND	U	0.41	0.12	1	05/06/10	05/24/10	KWG1004753	
trans-Nonachlor	0.11	J	0.41	0.094	1	05/06/10	05/24/10	KWG1004753	
Endosulfan I	ND	U	0.82	0.42	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDE	ND	U	2.1	0.70	1	05/06/10	05/24/10	KWG1004753	*
2,4'-DDD	ND	U	0.82	0.31	1	05/06/10	05/24/10	KWG1004753	*
Dieldrin	ND	U	0.82	0.22	1	05/06/10	05/24/10	KWG1004753	
Endrin	ND	U	0.82	0.45	1	05/06/10	05/24/10	KWG1004753	
2,4'-DDT	ND	U	0.82	0.46	1	05/06/10	05/24/10	KWG1004753	*
cis-Nonachlor	ND	U	0.41	0.13	1	05/06/10	05/24/10	KWG1004753	
4,4'-DDD	ND	U	0.82	0.13	1	05/06/10	05/24/10	KWG1004753	
Endosulfan II	ND	U	0.82	0.35	1	05/06/10	05/24/10	KWG1004753	
Endrin Aldehyde	ND	U	0.82	0.56	1	05/06/10	05/24/10	KWG1004753	*
4,4'-DDT	ND	U	0.82	0.35	1	05/06/10	05/24/10	KWG1004753	
Endosulfan Sulfate	ND	U	0.82	0.22	1	05/06/10	05/24/10	KWG1004753	*
Methoxychlor	ND	U	0.41	0.15	1	05/06/10	05/24/10	KWG1004753	
Endrin Ketone	ND	U	0.41	0.16	1	05/06/10	05/24/10	KWG1004753	
Mirex	ND	U	0.41	0.11	1	05/06/10	05/24/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: 08/01/2008
Date Received: 04/13/2010

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: EW-B10-BC-01-COMP2 **Units:** ug/Kg
Lab Code: K1003360-041 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	82	5-124	05/24/10	Acceptable
S_HXCBZ13C6	79	5-120	05/24/10	Acceptable
S_Heptachlor-13C10	124	5-128	05/24/10	Acceptable
S_Chlorpyrifos-d10	78	5-120	05/24/10	Acceptable
S_Aldrin-13C12	77	6-113	05/24/10	Acceptable
S_Ocstyrene13C8	78	5-120	05/24/10	Acceptable
S_Isodrin-13C12	78	5-120	05/24/10	Acceptable
S_Oxychlordane-13C10	77	5-144	05/24/10	Acceptable
S_Heptachlrepx13C10	63	8-146	05/24/10	Acceptable
S_Endrin-13C12	71	20-157	05/24/10	Acceptable
S_4,4'DDD-d4	70	5-120	05/24/10	Acceptable
S_4,4'-DDT-d4	64	13-200	05/24/10	Acceptable
S_Mxchlord14	66	8-200	05/24/10	Acceptable
S_Endrinket13C12	59	5-120	05/24/10	Acceptable
S_Mirex-13C10	50	5-138	05/24/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: NA
Date Received: NA

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	Method Blank	Units:	ug/Kg
Lab Code:	KWG1004738-5	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.72	0.26	1	05/07/10	05/21/10	KWG1004738	
gamma-BHC (Lindane)	ND	U	0.36	0.17	1	05/07/10	05/21/10	KWG1004738	
beta-BHC	ND	U	0.72	0.40	1	05/07/10	05/21/10	KWG1004738	*
delta-BHC	ND	U	0.72	0.28	1	05/07/10	05/21/10	KWG1004738	*
Hexachlorobenzene	ND	U	1.8	0.70	1	05/07/10	05/21/10	KWG1004738	
Heptachlor	ND	U	0.36	0.090	1	05/07/10	05/21/10	KWG1004738	
Chlorpyrifos	ND	U	0.36	0.13	1	05/07/10	05/21/10	KWG1004738	
Aldrin	ND	U	0.72	0.22	1	05/07/10	05/21/10	KWG1004738	
Octachlorostyrene	ND	U	0.36	0.16	1	05/07/10	05/21/10	KWG1004738	
Isodrin	ND	U	0.72	0.23	1	05/07/10	05/21/10	KWG1004738	
Oxychlordane	ND	U	1.8	0.77	1	05/07/10	05/21/10	KWG1004738	
Heptachlor Epoxide	ND	U	0.36	0.061	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDE	ND	U	0.72	0.42	1	05/07/10	05/21/10	KWG1004738	*
gamma-Chlordane	ND	U	0.36	0.13	1	05/07/10	05/21/10	KWG1004738	
alpha-Chlordane	ND	U	0.36	0.12	1	05/07/10	05/21/10	KWG1004738	
trans-Nonachlor	ND	U	0.36	0.094	1	05/07/10	05/21/10	KWG1004738	
Endosulfan I	ND	U	0.72	0.42	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDE	ND	U	1.8	0.70	1	05/07/10	05/21/10	KWG1004738	*
2,4'-DDD	ND	U	0.72	0.31	1	05/07/10	05/21/10	KWG1004738	*
Dieldrin	ND	U	0.72	0.22	1	05/07/10	05/21/10	KWG1004738	
Endrin	ND	U	0.72	0.45	1	05/07/10	05/21/10	KWG1004738	
2,4'-DDT	ND	U	0.72	0.46	1	05/07/10	05/21/10	KWG1004738	*
cis-Nonachlor	ND	U	0.36	0.13	1	05/07/10	05/21/10	KWG1004738	
4,4'-DDD	ND	U	0.72	0.13	1	05/07/10	05/21/10	KWG1004738	
Endosulfan II	ND	U	0.72	0.35	1	05/07/10	05/21/10	KWG1004738	
Endrin Aldehyde	ND	U	0.72	0.56	1	05/07/10	05/21/10	KWG1004738	*
4,4'-DDT	ND	U	0.72	0.35	1	05/07/10	05/21/10	KWG1004738	
Endosulfan Sulfate	ND	U	0.72	0.22	1	05/07/10	05/21/10	KWG1004738	*
Methoxychlor	ND	U	0.36	0.15	1	05/07/10	05/21/10	KWG1004738	
Endrin Ketone	ND	U	0.36	0.16	1	05/07/10	05/21/10	KWG1004738	
Mirex	ND	U	0.36	0.11	1	05/07/10	05/21/10	KWG1004738	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: NA
Date Received: NA

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: Method Blank **Units:** ug/Kg
Lab Code: KWG1004738-5 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	52	5-124	05/21/10	Acceptable
S_HXCBZ13C6	33	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	60	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	81	5-120	05/21/10	Acceptable
S_Aldrin-13C12	56	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	71	5-120	05/21/10	Acceptable
S_Isodrin-13C12	68	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	76	5-144	05/21/10	Acceptable
S_Heptachlrepx13C10	77	8-146	05/21/10	Acceptable
S_Endrin-13C12	82	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	83	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	89	13-200	05/21/10	Acceptable
S_Mxchlord14	92	8-200	05/21/10	Acceptable
S_Endrinket13C12	84	5-120	05/21/10	Acceptable
S_Mirex-13C10	74	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: NA
Date Received: NA

Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	Method Blank	Units:	ug/Kg
Lab Code:	KWG1004753-5	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.81	0.26	1	05/06/10	05/21/10	KWG1004753	
gamma-BHC (Lindane)	ND	U	0.41	0.17	1	05/06/10	05/21/10	KWG1004753	
beta-BHC	ND	U	0.81	0.40	1	05/06/10	05/21/10	KWG1004753	*
delta-BHC	ND	U	0.81	0.28	1	05/06/10	05/21/10	KWG1004753	*
Hexachlorobenzene	ND	U	2.1	0.70	1	05/06/10	05/21/10	KWG1004753	*
Heptachlor	ND	U	0.41	0.090	1	05/06/10	05/21/10	KWG1004753	
Chlorpyrifos	ND	U	0.41	0.13	1	05/06/10	05/21/10	KWG1004753	*
Aldrin	ND	U	0.81	0.22	1	05/06/10	05/21/10	KWG1004753	
Octachlorostyrene	ND	U	0.41	0.16	1	05/06/10	05/21/10	KWG1004753	
Isodrin	ND	U	0.81	0.23	1	05/06/10	05/21/10	KWG1004753	
Oxychlordane	ND	U	2.1	0.77	1	05/06/10	05/21/10	KWG1004753	
Heptachlor Epoxide	ND	U	0.41	0.061	1	05/06/10	05/21/10	KWG1004753	
2,4'-DDE	ND	U	0.81	0.42	1	05/06/10	05/21/10	KWG1004753	*
gamma-Chlordane	ND	U	0.41	0.13	1	05/06/10	05/21/10	KWG1004753	
alpha-Chlordane	ND	U	0.41	0.12	1	05/06/10	05/21/10	KWG1004753	
trans-Nonachlor	ND	U	0.41	0.094	1	05/06/10	05/21/10	KWG1004753	
Endosulfan I	ND	U	0.81	0.42	1	05/06/10	05/21/10	KWG1004753	
4,4'-DDE	ND	U	2.1	0.70	1	05/06/10	05/21/10	KWG1004753	*
2,4'-DDD	ND	U	0.81	0.31	1	05/06/10	05/21/10	KWG1004753	*
Dieldrin	ND	U	0.81	0.22	1	05/06/10	05/21/10	KWG1004753	
Endrin	ND	U	0.81	0.45	1	05/06/10	05/21/10	KWG1004753	
2,4'-DDT	ND	U	0.81	0.46	1	05/06/10	05/21/10	KWG1004753	*
cis-Nonachlor	ND	U	0.41	0.13	1	05/06/10	05/21/10	KWG1004753	
4,4'-DDD	ND	U	0.81	0.13	1	05/06/10	05/21/10	KWG1004753	
Endosulfan II	ND	U	0.81	0.35	1	05/06/10	05/21/10	KWG1004753	
Endrin Aldehyde	ND	U	0.81	0.56	1	05/06/10	05/21/10	KWG1004753	*
4,4'-DDT	ND	U	0.81	0.35	1	05/06/10	05/21/10	KWG1004753	
Endosulfan Sulfate	ND	U	0.81	0.22	1	05/06/10	05/21/10	KWG1004753	*
Methoxychlor	ND	U	0.41	0.15	1	05/06/10	05/21/10	KWG1004753	
Endrin Ketone	ND	U	0.41	0.16	1	05/06/10	05/21/10	KWG1004753	
Mirex	ND	U	0.41	0.11	1	05/06/10	05/21/10	KWG1004753	

* See Case Narrative

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Collected: NA
Date Received: NA

Chlorinated Pesticides by HRGC/MS/MS

Sample Name: Method Blank **Units:** ug/Kg
Lab Code: KWG1004753-5 **Basis:** Wet

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
S_GBHCD6	79	5-124	05/21/10	Acceptable
S_HXCBZ13C6	50	5-120	05/21/10	Acceptable
S_Heptachlor-13C10	96	5-128	05/21/10	Acceptable
S_Chlorpyrifos-d10	75	5-120	05/21/10	Acceptable
S_Aldrin-13C12	74	6-113	05/21/10	Acceptable
S_Ocstyrene13C8	73	5-120	05/21/10	Acceptable
S_Isodrin-13C12	79	5-120	05/21/10	Acceptable
S_Oxychlordane-13C10	82	5-144	05/21/10	Acceptable
S_Heptachlrepx13C10	77	8-146	05/21/10	Acceptable
S_Endrin-13C12	80	20-157	05/21/10	Acceptable
S_4,4'DDD-d4	77	5-120	05/21/10	Acceptable
S_4,4'-DDT-d4	82	13-200	05/21/10	Acceptable
S_Mxchlord14	84	8-200	05/21/10	Acceptable
S_Endrinket13C12	72	5-120	05/21/10	Acceptable
S_Mirex-13C10	64	5-138	05/21/10	Acceptable

Comments: _____

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental **Service Request:** K1003360
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Surrogate Recovery Summary
Chlorinated Pesticides by HRGC/MS/MS

Extraction Method: EPA 3541 **Units:** PERCENT
Analysis Method: CAS SOC-PESTMS2 **Level:** Low

Sample Name	Lab Code	Sur1	Sur2	Sur3	Sur4	Sur5	Sur6	Sur7	Sur8
EW08-MS-WB-SUPCOMP1	K1003360-001	80	66	104	82	76	77	86	80
EW08-MS-WB-SUPCOMP2	K1003360-002	81	43	114	79	75	75	88	75
EW08-MS-WB-SUPCOMP3	K1003360-003	76	58	106	78	69	74	85	76
EW08-RRDC-EM-SUPCOMP3	K1003360-006	60	43	96	71	58	65	70	65
EW08-RRDC-HP-SUPCOMP3	K1003360-009	86	42	115	82	78	82	99	87
EW08-ES-WB-SUPCOMP2	K1003360-011	67	41	116	72	70	71	81	66
EW08-ES-FL-SUPCOMP1	K1003360-013	78	64	134	*	77	73	76	91
EW08-SS-WB-SUPCOMP1	K1003360-016	63	56	102	64	63	62	79	61
EW-S01-GD-Comp01	K1003360-025	74	60	120	79	71	73	83	74
EW-S01-GD-GB-Comp01	K1003360-026	79	44	127	76	72	78	88	76
EW-08-SB004-BR-04	K1003360-027	83	40	117	79	74	77	89	79
EW-08-SB005-BR-05	K1003360-028	81	44	124	79	72	78	89	78
EW-08-SB006-BR-06	K1003360-029	80	43	121	76	75	76	93	81
EW-08-SB007-BR-07	K1003360-030	86	44	130	*	80	77	79	97
EW-08-SB008-BR-08	K1003360-031	82	44	131	*	81	77	80	94
EW-08-SB009-BR-09	K1003360-032	78	39	111	71	76	72	88	74
EW-08-SB012-BR-10	K1003360-033	102	93	122	87	94	88	107	100
EW-08-SB011-BR-11	K1003360-034	97	88	122	92	93	91	112	116
EW-08-SB013-BR-13	K1003360-035	90	44	95	83	81	86	87	104
EW-B06-BC-01-COMP2	K1003360-036	84	77	131	*	80	76	81	80
EW-B03-BC-03-COMP1	K1003360-037	89	81	123	85	78	90	105	95
EW-B08-BC-01-COMP2	K1003360-038	89	83	147	*	83	86	58	86
EW-B08-CN-02-COMP1	K1003360-039	87	81	136	*	87	84	101	94
EW-B09-MY-M-COMP1	K1003360-040	85	80	139	*	85	83	82	84
EW-B10-BC-01-COMP2	K1003360-041	82	79	124	78	77	78	78	77
Method Blank	KWG1004738-5	52	33	60	81	56	71	68	76
Method Blank	KWG1004753-5	79	50	96	75	74	73	79	82
EW08-MS-WB-SUPCOMP1MS	KWG1004738-1	91	77	116	87	84	84	93	86
EW08-MS-WB-SUPCOMP1DM	KWG1004738-2	82	62	101	79	77	77	91	78
EW-B09-MY-M-COMP1MS	KWG1004753-1	87	83	138	*	85	81	82	115
EW-B09-MY-M-COMP1DMS	KWG1004753-2	83	80	140	*	81	77	84	95
Lab Control Sample	KWG1004738-3	60	58	106	70	75	75	82	79
Duplicate Lab Control Sample	KWG1004738-4	50	51	89	59	62	70	73	66
Lab Control Sample	KWG1004753-3	66	59	103	72	73	78	86	81

Surrogate Recovery Control Limits (%)

Sur1 = S_GHBCD6	5-124	Sur5 = S_Aldrin-13C12	6-113
Sur2 = S_HXCBZ13C6	5-120	Sur6 = S_Ocstyrene13C8	5-120
Sur3 = S_Heptachlor-13C10	5-128	Sur7 = S_Isodrin-13C12	5-120
Sur4 = S_Chlorpyrifos-d10	5-120	Sur8 = S_Oxychlordane-13C10	5-144

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental **Service Request:** K1003360
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Surrogate Recovery Summary
Chlorinated Pesticides by HRGC/MS/MS

Extraction Method: EPA 3541 **Units:** PERCENT
Analysis Method: CAS SOC-PESTMS2 **Level:** Low

Sample Name	Lab Code	Sur1	Sur2	Sur3	Sur4	Sur5	Sur6	Sur7	Sur8
Duplicate Lab Control Sample	KWG1004753-4	53	72	116	71	79	78	89	87

Surrogate Recovery Control Limits (%)

Sur1 = S_GBHCD6	5-124	Sur5 = S_Aldrin-13C12	6-113
Sur2 = S_HXCBZ13C6	5-120	Sur6 = S_Ocstyrene13C8	5-120
Sur3 = S_Heptachlor-13C10	5-128	Sur7 = S_Isodrin-13C12	5-120
Sur4 = S_Chlorpyrifos-d10	5-120	Sur8 = S_Oxychlordane-13C10	5-144

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental **Service Request:** K1003360
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Surrogate Recovery Summary
Chlorinated Pesticides by HRGC/MS/MS

Extraction Method: EPA 3541 **Units:** PERCENT
Analysis Method: CAS SOC-PESTMS2 **Level:** Low

Sample Name	Lab Code	Sur9	Sur10	Sur11	Sur12	Sur13	Sur14	Sur15
EW08-MS-WB-SUPCOMP1	K1003360-001	77	76	71	63	69	61	53
EW08-MS-WB-SUPCOMP2	K1003360-002	62	75	69	63	75	60	51
EW08-MS-WB-SUPCOMP3	K1003360-003	64	74	67	70	78	61	52
EW08-RRDC-EM-SUPCOMP3	K1003360-006	63	71	64	62	70	57	49
EW08-RRDC-HP-SUPCOMP3	K1003360-009	68	78	74	75	83	66	57
EW08-ES-WB-SUPCOMP2	K1003360-011	60	70	65	64	74	56	49
EW08-ES-FL-SUPCOMP1	K1003360-013	62	74	69	61	74	57	49
EW08-SS-WB-SUPCOMP1	K1003360-016	52	62	53	44	50	43	37
EW-S01-GD-Comp01	K1003360-025	63	72	65	67	77	59	50
EW-S01-GD-GB-Comp01	K1003360-026	68	77	70	72	84	64	53
EW-08-SB004-BR-04	K1003360-027	68	72	69	67	78	61	51
EW-08-SB005-BR-05	K1003360-028	66	76	70	69	79	61	52
EW-08-SB006-BR-06	K1003360-029	66	76	68	65	76	59	50
EW-08-SB007-BR-07	K1003360-030	71	76	73	70	80	62	52
EW-08-SB008-BR-08	K1003360-031	74	75	72	75	82	61	53
EW-08-SB009-BR-09	K1003360-032	63	69	65	62	72	55	47
EW-08-SB012-BR-10	K1003360-033	72	84	77	93	91	69	64
EW-08-SB011-BR-11	K1003360-034	77	94	85	93	92	73	64
EW-08-SB013-BR-13	K1003360-035	66	88	74	82	84	72	58
EW-B06-BC-01-COMP2	K1003360-036	71	74	74	69	78	63	55
EW-B03-BC-03-COMP1	K1003360-037	66	92	75	78	85	66	59
EW-B08-BC-01-COMP2	K1003360-038	64	81	76	74	76	57	56
EW-B08-CN-02-COMP1	K1003360-039	73	76	73	64	71	61	52
EW-B09-MY-M-COMP1	K1003360-040	74	83	71	59	66	56	51
EW-B10-BC-01-COMP2	K1003360-041	63	71	70	64	66	59	50
Method Blank	KWG1004738-5	77	82	83	89	92	84	74
Method Blank	KWG1004753-5	77	80	77	82	84	72	64
EW08-MS-WB-SUPCOMP1MS	KWG1004738-1	83	87	75	89	94	71	65
EW08-MS-WB-SUPCOMP1DM	KWG1004738-2	76	71	69	77	82	64	59
EW-B09-MY-M-COMP1MS	KWG1004753-1	66	79	74	69	80	60	58
EW-B09-MY-M-COMP1DMS	KWG1004753-2	62	83	70	67	76	61	57
Lab Control Sample	KWG1004738-3	78	79	63	61	72	67	60
Duplicate Lab Control Sample	KWG1004738-4	69	75	55	52	65	60	52
Lab Control Sample	KWG1004753-3	83	86	59	59	75	63	61

Surrogate Recovery Control Limits (%)

Sur9 = S_Heptachlrepxox13C10	8-146	Sur13 = S_Mxchlrd14	8-200
Sur10 = S_Endrin-13C12	20-157	Sur14 = S_Endrinket13C12	5-120
Sur11 = S_4,4'DDD-d4	5-120	Sur15 = S_Mirex-13C10	5-138
Sur12 = S_4,4'-DDT-d4	13-200	=	

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental **Service Request:** K1003360
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Surrogate Recovery Summary
Chlorinated Pesticides by HRGC/MS/MS

Extraction Method: EPA 3541 **Units:** PERCENT
Analysis Method: CAS SOC-PESTMS2 **Level:** Low

Sample Name	Lab Code	Sur9	Sur10	Sur11	Sur12	Sur13	Sur14	Sur15
Duplicate Lab Control Sample	KWG1004753-4	82	79	54	45	81	66	57

Surrogate Recovery Control Limits (%)

Sur9 = S_Heptachlrepx13C10	8-146	Sur13 = S_Mxchlord14	8-200
Sur10 = S_Endrin-13C12	20-157	Sur14 = S_Endrinket13C12	5-120
Sur11 = S_4,4'DDD-d4	5-120	Sur15 = S_Mirex-13C10	5-138
Sur12 = S_4,4'-DDT-d4	13-200	=	

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Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Extracted: 05/07/2010
Date Analyzed: 05/21/2010

Matrix Spike/Duplicate Matrix Spike Summary
Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW08-MS-WB-SUPCOMP1	Units:	ug/Kg
Lab Code:	K1003360-001	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2	Extraction Lot:	KWG1004738

Analyte Name	Sample Result	EW08-MS-WB-SUPCOMP1			EW08-MS-WB-SUPCOMP1D			%Rec Limits	RPD	RPD Limit			
		Matrix Spike			Duplicate Matrix Spike								
		Result	Expected	%Rec	Result	Expected	%Rec						
alpha-BHC	ND	5.30	8.33	64	6.02	9.26	65	50-120	13	30			
gamma-BHC (Lindane)	ND	8.42	8.33	101	9.14	9.26	99	50-120	8	30			
beta-BHC	ND	8.44	8.33	101	9.47	9.26	102	50-120	12	30			
delta-BHC	ND	5.09	8.33	61	5.80	9.26	63	50-120	13	30			
Hexachlorobenzene	ND	8.99	8.33	108	10.5	9.26	113	50-120	15	30			
Heptachlor	0.10	8.54	8.33	101	9.50	9.26	102	50-120	11	30			
Chlorpyrifos	ND	10.6	8.33	127	11.7	9.26	126	19-163	10	30			
Aldrin	ND	8.36	8.33	100	9.42	9.26	102	50-120	12	30			
Octachlorostyrene	ND	8.78	8.33	105	9.86	9.26	106	50-120	12	30			
Isodrin	ND	8.77	8.33	105	9.09	9.26	98	50-120	4	30			
Oxychlordane	ND	8.43	8.33	101	9.55	9.26	103	50-120	12	30			
Heptachlor Epoxide	ND	7.20	8.33	86	8.28	9.26	89	50-120	14	30			
2,4'-DDE	ND	8.81	8.33	106	9.67	9.26	104	24-123	9	30			
gamma-Chlordanne	ND	7.86	8.33	94	8.76	9.26	95	50-120	11	30			
alpha-Chlordanne	ND	7.79	8.33	93	8.78	9.26	95	50-120	12	30			
trans-Nonachlor	0.11	7.86	8.33	93	8.72	9.26	93	50-120	10	30			
Endosulfan I	ND	8.34	8.33	100	10.3	9.26	111	50-120	21	30			
4,4'-DDE	ND	8.81	8.33	106	9.72	9.26	105	50-120	10	30			
2,4'-DDD	ND	8.91	8.33	107	9.84	9.26	106	50-120	10	30			
Dieldrin	ND	7.54	8.33	91	9.00	9.26	97	50-120	18	30			
Endrin	ND	8.29	8.33	99	9.84	9.26	106	50-120	17	30			
2,4'-DDT	ND	8.79	8.33	105	9.82	9.26	106	50-120	11	30			
cis-Nonachlor	ND	7.69	8.33	92	8.40	9.26	91	50-120	9	30			
4,4'-DDD	0.17	8.47	8.33	100	9.58	9.26	102	42-120	12	30			
Endosulfan II	ND	5.14	8.33	62	6.01	9.26	65	5-200	16	30			
Endrin Aldehyde	ND	3.53	8.33	42 *	3.19	9.26	34 *	50-120	10	30			
4,4'-DDT	ND	8.64	8.33	104	9.63	9.26	104	50-120	11	30			
Endosulfan Sulfate	ND	7.13	8.33	86	8.68	9.26	94	50-200	20	30			
Methoxychlor	ND	8.27	8.33	99	9.23	9.26	100	50-120	11	30			
Endrin Ketone	ND	7.98	8.33	96	9.27	9.26	100	50-134	15	30			
Mirex	0.11	9.00	8.33	107	10.0	9.26	107	50-120	11	30			

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Extracted: 05/06/2010
Date Analyzed: 05/24/2010

Matrix Spike/Duplicate Matrix Spike Summary
Chlorinated Pesticides by HRGC/MS/MS

Sample Name:	EW-B09-MY-M-COMP1	Units:	ug/Kg
Lab Code:	K1003360-040	Basis:	Wet
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	CAS SOC-PESTMS2	Extraction Lot:	KWG1004753

Analyte Name	Sample Result	EW-B09-MY-M-COMP1MS			EW-B09-MY-M-COMP1DMS			%Rec Limits	RPD	RPD Limit			
		Matrix Spike			Duplicate Matrix Spike								
		Result	Expected	%Rec	Result	Expected	%Rec						
alpha-BHC	ND	8.14	8.10	101	8.82	8.66	102	50-120	8	30			
gamma-BHC (Lindane)	ND	8.49	8.10	105	9.37	8.66	108	50-120	10	30			
beta-BHC	ND	8.14	8.10	101	9.38	8.66	108	50-120	14	30			
delta-BHC	ND	5.24	8.10	65	5.63	8.66	65	50-120	7	30			
Hexachlorobenzene	1.5	9.27	8.10	96	9.95	8.66	97	50-120	7	30			
Heptachlor	ND	9.08	8.10	112	9.96	8.66	115	50-120	9	30			
Chlorpyrifos	ND	10.1	8.10	125	11.1	8.66	128	19-163	9	30			
Aldrin	ND	8.55	8.10	106	9.95	8.66	115	50-120	15	30			
Octachlorostyrene	ND	9.17	8.10	113	9.63	8.66	111	50-120	5	30			
Isodrin	ND	7.88	8.10	97	9.92	8.66	115	50-120	23	30			
Oxychlordane	ND	ND	8.10	0 *	ND	8.66	0 *	50-120		30			
Heptachlor Epoxide	ND	8.59	8.10	106	10.1	8.66	116	50-120	16	30			
2,4'-DDE	ND	7.81	8.10	96	9.62	8.66	111	24-123	21	30			
gamma-Chlordanne	ND	7.92	8.10	98	8.30	8.66	96	50-120	5	30			
alpha-Chlordanne	ND	7.82	8.10	97	8.24	8.66	95	50-120	5	30			
trans-Nonachlor	ND	7.67	8.10	95	8.14	8.66	94	50-120	6	30			
Endosulfan I	ND	ND	8.10	0 *	ND	8.66	0 *	50-120		30			
4,4'-DDE	ND	8.32	8.10	103	9.53	8.66	110	50-120	14	30			
2,4'-DDD	ND	8.91	8.10	110	10.3	8.66	119	50-120	14	30			
Dieldrin	ND	7.41	8.10	92	8.35	8.66	96	50-120	12	30			
Endrin	ND	7.97	8.10	98	8.37	8.66	97	50-120	5	30			
2,4'-DDT	ND	9.36	8.10	116	10.5	8.66	121 *	50-120	11	30			
cis-Nonachlor	ND	5.62	8.10	69	6.76	8.66	78	50-120	18	30			
4,4'-DDD	0.16	8.57	8.10	104	9.81	8.66	112	42-120	14	30			
Endosulfan II	ND	5.14	8.10	63	5.40	8.66	62	5-200	5	30			
Endrin Aldehyde	ND	ND	8.10	0 *	ND	8.66	0 *	50-120		30			
4,4'-DDT	ND	8.66	8.10	107	9.76	8.66	113	50-120	12	30			
Endosulfan Sulfate	ND	6.72	8.10	83	7.03	8.66	81	50-200	4	30			
Methoxychlor	ND	9.67	8.10	119	11.6	8.66	134 *	50-120	18	30			
Endrin Ketone	ND	8.39	8.10	104	9.27	8.66	107	50-134	10	30			
Mirex	ND	9.04	8.10	112	9.99	8.66	115	50-120	10	30			

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Extracted: 05/07/2010
Date Analyzed: 05/21/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Chlorinated Pesticides by HRGC/MS/MS

Extraction Method: EPA 3541 **Units:** ug/Kg
Analysis Method: CAS SOC-PESTMS2 **Basis:** Wet
 Level: Low
 Extraction Lot: KWG1004738

Analyte Name	Lab Control Sample KWG1004738-3			Duplicate Lab Control Sample KWG1004738-4			%Rec Limits	RPD	RPD Limit			
	Lab Control Spike			Duplicate Lab Control Spike								
	Result	Expected	%Rec	Result	Expected	%Rec						
alpha-BHC	7.42	9.85	75	6.27	8.33	75	50-120	17	30			
gamma-BHC (Lindane)	7.78	9.85	79	6.44	8.33	77	50-120	19	30			
beta-BHC	13.0	9.85	132 *	13.3	8.33	160 *	50-120	2	30			
delta-BHC	0.310	9.85	3 *	0.187	8.33	2 *	50-120	49 *	30			
Hexachlorobenzene	10.5	9.85	107	9.02	8.33	108	50-120	15	30			
Heptachlor	9.72	9.85	99	8.46	8.33	102	50-120	14	30			
Chlorpyrifos	9.89	9.85	100	8.77	8.33	105	50-120	12	30			
Aldrin	9.32	9.85	95	8.25	8.33	99	50-120	12	30			
Octachlorostyrene	10.5	9.85	106	8.92	8.33	107	50-120	16	30			
Isodrin	9.89	9.85	100	7.76	8.33	93	50-120	24	30			
Oxychlordane	9.72	9.85	99	8.66	8.33	104	50-120	12	30			
Heptachlor Epoxide	9.63	9.85	98	8.28	8.33	99	50-120	15	30			
2,4'-DDE	12.8	9.85	130 *	12.6	8.33	151 *	24-123	1	30			
gamma-Chlordane	9.56	9.85	97	9.04	8.33	108	50-120	6	30			
alpha-Chlordane	9.48	9.85	96	8.89	8.33	107	50-120	6	30			
trans-Nonachlor	9.56	9.85	97	9.26	8.33	111	50-120	3	30			
Endosulfan I	9.41	9.85	96	8.26	8.33	99	50-120	13	30			
4,4'-DDE	13.9	9.85	141 *	14.4	8.33	173 *	50-120	4	30			
2,4'-DDD	12.5	9.85	126 *	12.2	8.33	147 *	50-120	2	30			
Dieldrin	9.33	9.85	95	7.76	8.33	93	50-120	18	30			
Endrin	10.0	9.85	102	8.49	8.33	102	50-120	17	30			
2,4'-DDT	11.9	9.85	121 *	11.0	8.33	132 *	50-120	8	30			
cis-Nonachlor	9.35	9.85	95	8.27	8.33	99	50-120	12	30			
4,4'-DDD	9.62	9.85	98	8.14	8.33	98	42-120	17	30			
Endosulfan II	8.22	9.85	83	7.03	8.33	84	5-200	16	30			
Endrin Aldehyde	4.07	9.85	41 *	2.77	8.33	33 *	50-120	38 *	30			
4,4'-DDT	9.63	9.85	98	8.76	8.33	105	50-120	9	30			
Endosulfan Sulfate	1.33	9.85	14 *	1.06	8.33	13 *	50-200	23	30			
Methoxychlor	9.87	9.85	100	8.57	8.33	103	50-120	14	30			
Endrin Ketone	9.58	9.85	97	8.54	8.33	102	50-134	12	30			
Mirex	10.4	9.85	105	8.85	8.33	106	50-120	16	30			

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental
Project: EW RI/FS Fish and Crab Sampling/08-08-09-41
Sample Matrix: Animal tissue

Service Request: K1003360
Date Extracted: 05/06/2010
Date Analyzed: 05/21/2010

Lab Control Spike/Duplicate Lab Control Spike Summary
Chlorinated Pesticides by HRGC/MS/MS

Extraction Method: EPA 3541 **Units:** ug/Kg
Analysis Method: CAS SOC-PESTMS2 **Basis:** Wet
 Level: Low
 Extraction Lot: KWG1004753

Analyte Name	Lab Control Sample KWG1004753-3			Duplicate Lab Control Sample KWG1004753-4			%Rec Limits	RPD	RPD Limit			
	Lab Control Spike			Duplicate Lab Control Spike								
	Result	Expected	%Rec	Result	Expected	%Rec						
alpha-BHC	8.63	9.95	87	6.95	9.95	70	50-120	21	30			
gamma-BHC (Lindane)	9.64	9.95	97	8.12	9.95	82	50-120	17	30			
beta-BHC	14.6	9.95	147 *	17.1	9.95	172 *	50-120	16	30			
delta-BHC	3.68	9.95	37 *	3.30	9.95	33 *	50-120	11	30			
Hexachlorobenzene	12.1	9.95	122 *	13.6	9.95	137 *	50-120	12	30			
Heptachlor	10.9	9.95	110	10.7	9.95	108	50-120	2	30			
Chlorpyrifos	11.9	9.95	120	12.1	9.95	122 *	50-120	2	30			
Aldrin	10.7	9.95	108	10.1	9.95	101	50-120	6	30			
Octachlorostyrene	11.1	9.95	112	10.8	9.95	109	50-120	3	30			
Isodrin	10.7	9.95	108	10.1	9.95	102	50-120	5	30			
Oxychlordane	11.4	9.95	115	9.27	9.95	93	50-120	21	30			
Heptachlor Epoxide	10.2	9.95	102	8.87	9.95	89	50-120	14	30			
2,4'-DDE	15.2	9.95	152 *	15.1	9.95	152 *	24-123	0	30			
gamma-Chlordane	10.3	9.95	104	8.96	9.95	90	50-120	14	30			
alpha-Chlordane	10.2	9.95	103	8.92	9.95	90	50-120	14	30			
trans-Nonachlor	10.4	9.95	104	9.05	9.95	91	50-120	14	30			
Endosulfan I	10.2	9.95	102	11.8	9.95	119	50-120	15	30			
4,4'-DDE	16.3	9.95	164 *	19.3	9.95	194 *	50-120	17	30			
2,4'-DDD	13.7	9.95	137 *	14.5	9.95	146 *	50-120	6	30			
Dieldrin	9.38	9.95	94	9.57	9.95	96	50-120	2	30			
Endrin	10.1	9.95	101	10.4	9.95	104	50-120	3	30			
2,4'-DDT	13.9	9.95	140 *	17.9	9.95	179 *	50-120	25	30			
cis-Nonachlor	9.57	9.95	96	8.11	9.95	82	50-120	16	30			
4,4'-DDD	10.5	9.95	106	9.91	9.95	100	42-120	6	30			
Endosulfan II	8.25	9.95	83	6.83	9.95	69	5-200	19	30			
Endrin Aldehyde	3.04	9.95	31 *	2.75	9.95	28 *	50-120	10	30			
4,4'-DDT	10.9	9.95	109	10.6	9.95	106	50-120	3	30			
Endosulfan Sulfate	3.26	9.95	33 *	2.11	9.95	21 *	50-200	43 *	30			
Methoxychlor	10.6	9.95	107	10.1	9.95	101	50-120	5	30			
Endrin Ketone	10.3	9.95	104	9.76	9.95	98	50-134	5	30			
Mirex	11.2	9.95	113	10.9	9.95	110	50-120	3	30			

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ATTACHMENT 4

DATA VALIDATION



EcoChem, INC.
Environmental Data Quality

DATA VALIDATION REPORT

East Waterway - Fish and Shellfish Tissue Collection

Prepared for:

Windward Environmental, LLC
200 West Mercer Street, Suite 401
Seattle, Washington 98119

Prepared by:

EcoChem, Inc.
710 Second Avenue, Suite 660
Seattle, Washington 98104

EcoChem Project: C22018-6

August 4, 2010

Approved for Release:



Chris Ransom
Project Manager
EcoChem, Inc.

PROJECT NARRATIVE

Basis for the Data Validation

This report summarizes the results of full (EPA Stage 4) validation performed on tissue and quality control sample data for the East Waterway – Fish and Shellfish Tissue Collection. A complete list of samples is provided in the **SAMPLE INDEX**.

Samples were analyzed by Columba Analytical Services, (CAS), Kelso, Washington. The analytical methods and EcoChem project chemists are listed below.

Analysis	Method	Primary Review	Secondary Review
Chlorinated Pesticides	EPA 1699M	Mark Brindle	Eric Strout

The data were reviewed using guidance and quality control criteria documented in laboratory analytical procedure (Columbia Analytical Services SOC-PESTMS2, Revision 2, 11/30/09); the QAPP, *East Waterway Operable Unit Supplemental RIFS, Fish and Shellfish Tissue Collection and Chemical Analysis* (December, 2008); and *National Functional Guidelines for Organic Data Review* (USEPA 1999).

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions and reason codes are included as **APPENDIX A**. A Qualified Data Summary Table is included in **APPENDIX B**. Data Validation Worksheets will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) is also submitted with this report.

Sample Index
East Waterway
Fish and Crab Sampling

Sample ID	Laboratory ID
EW08-MS-WB-SUPCOMP1_T4	K1003360-001
EW08-RRDC-EM-SUPCOMP3_T4	K1003360-006
EW08-RRDC-HP-SUPCOMP3_T4	K1003360-009
EW08-ES-WB-SUPCOMP2_T4	K1003360-011
EW08-ES-FL-SUPCOMP1_T4	K1003360-013
EW08-SS-WB-SUPCOMP1_T4	K1003360-016
EW-S01-GD-Comp01	K1003360-025
EW-S01-GD-GB-Comp01_T4	K1003360-026
EW-08-SB004-BR-04_T4	K1003360-027
EW-08-SB005-BR-05_T4	K1003360-028
EW-08-SB006-BR-06_T4	K1003360-029
EW-08-SB007-BR-07_T4	K1003360-030
EW-08-SB008-BR-08_T4	K1003360-031
EW-08-SB009-BR-09_T4	K1003360-032
EW-08-SB012-BR-10_T4	K1003360-033
EW-08-SB011-BR-11_T4	K1003360-034
EW-08-SB013-BR-13_T4	K1003360-035
EW-B06-BC-01-COMP2_T4	K1003360-036
EW-B03-BC-03-COMP1_T4	K1003360-037
EW-B08-BC-01-COMP2_T4	K1003360-038
EW-B08-CN-02-COMP1_T4	K1003360-039
EW-B09-MY-M-COMP1_T4	K1003360-040
EW-B10-BC-01-COMP2_T4	K1003360-041

DATA VALIDATION REPORT

East Waterway – Fish and Shellfish Tissue

Chlorinated Pesticides by EPA Method 1699M

This report documents the review of analytical data from the analysis of tissue samples and the associated laboratory quality control (QC) samples. Samples were analyzed by Columbia Analytical Services, Inc., Kelso, Washington. Refer to the **Sample Index** for a list of samples reviewed.

SDG	Number of Samples	Validation Level
K1003360	23 Tissue	S4VEM

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

II. EDD TO HARDCOPY VERIFICATION

A complete (100%) verification of the electronic data deliverable (EDD) results was performed by comparison to the hardcopy laboratory data package. Laboratory QC results were also verified (10%).

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

	Sample Preservation and Holding Times	2	Matrix Spike/Matrix Spike Duplicates (MS/MSD)
	GC/MS Instrument Performance		Internal Standards
	Initial Calibration (ICAL)	1	Field Duplicates
1	Continuing Calibration (CCAL)		Target Analyte List
	Laboratory Blanks		Reporting Limits
1	Field Blanks	1	Reported Results
1	Labeled Compounds		Compound Identification
2	Laboratory Control Samples (LCS/LCSD)	1	Calculation Verification

¹ Quality control results are discussed below, but no data were qualified.

² Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Continuing Calibration

The percent difference (%D) values for cis-nonachlor (-27%) and endosulfan II (-30%) were outside of control limits in the continuing calibration on 5/26/2010 at 16:00, indicating a potential low bias. Only the dilution analysis of Sample EW-08-SB008-BR-08 was associated with this CCAL. These analytes were not reported from the dilution; no further action was necessary.

Field Blanks

No samples identified as field blanks were submitted.

Labeled Compounds

The percent recovery (%R) values for heptachlor-¹³C₁₀ were greater than the upper control limit in Samples EW08-ES-FL-SUPCOMP1, EW-08-SB007-BR-07, EW-08-SB008-BR-08, EW-B06-BC-01-COMP2, EW-B08-BC-01-COMP2, EW-B08-CN-02-COMP1, and EW-B09-MY-M-COMP1. This labeled compound is only associated with heptachlor. Heptachlor was not detected in any of these samples. The detection limits were not affected by the potential high bias; no further action was necessary.

Laboratory Control Samples

For the laboratory control sample/laboratory control sample duplicate (LCS/LCSD) set prepared 5/6/2010 (KWG1004753-3,-4), the percent recovery (%R) values for delta-BHC, endrin aldehyde, and endosulfan sulfate were less than the laboratory lower control limit. The reporting limits were estimated (J/UJ-10) in all associated samples. The %R values for beta-BHC, hexachlorobenzene, 2,4'-DDE, 4,4'-DDE, 2,4'-DDD, and 2,4'-DDT were greater than the upper control limits. All positive results for these analytes were estimated (J-10) in all associated samples.

For the LCS/LCSD set prepared 5/7/2010 (KWG1004738-3,-4), the %R values for endrin aldehyde and endosulfan sulfate were less than the lower control limit. The reporting limits were estimated (J/UJ-10) in all associated samples. The %R values for delta-BHC were less than the lower control limit and less than 10%. The reporting limits were rejected (R-10) in all associated samples. The %R values for beta-BHC, 2,4'-DDE, 4,4'-DDE, 2,4'-DDD, and 2,4'-DDT were greater than the upper control limits. All positive results for these analytes were estimated (J-10) in all associated samples.

The relative percent difference (RPD) values were greater than the 30% control limit for endosulfan sulfate in the 5/6/2010 LCS/LCSD set, and for delta-BHC and endrin aldehyde in the 5/7/2010 set. These analytes were not detected in any associated sample. No action was necessary.

Matrix Spike/Matrix Spike Duplicates

Sample EW08-MS-WB-SUPCOMP1 was used for the matrix spike/matrix spike duplicate (MS/MSD) analyses. The percent recovery (%R) values for endrin aldehyde were less than the lower control limit. This analyte was not detected; the reporting limit was estimated (UJ-8) in the parent sample.

MS/MSD analyses were also performed using Sample EW-B09-MY-M-COMP1. Oxychlordane, endosulfan I, and endrin aldehyde were not recovered in the MS or MSD. These analytes were not detected in the parent sample; reporting limits were rejected (R-8).

Field Duplicates

No samples identified as field duplicates were submitted.

Reported Results

In Sample EW-08-SB008-BR-08, the concentration of 4,4'-DDE was greater than the calibrated linear range of the instrument. This sample was re-analyzed at dilution and the 4,4'-DDE result was reported from the dilution. No action was necessary.

Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

IV. OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. With the exceptions noted above, accuracy was acceptable as demonstrated by the surrogate, LCS/LCSD, and MS/MSD recoveries; and precision was acceptable as demonstrated by the RPD values for the MS/MSD and LCS/LCSD analyses.

Data were estimated based on LCS/LCSD and MS/MSD accuracy outliers.

Data were rejected based on MS/MSD and LCS/LCSD %R values that were less than 10%.

Data that have been rejected should not be used for any purpose. All other data, as qualified, are acceptable for use.



EcoChem, INC.
Environmental Data Quality

APPENDIX A

DATA QUALIFIER DEFINITIONS AND REASON CODES

DATA VALIDATION QUALIFIER CODES

Based on National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

- U** The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J** The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- NJ** The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents the approximate concentration.
- UJ** The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R** The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

- DNR** Do not report; a more appropriate result is reported from another analysis or dilution.
-

DATA QUALIFIER REASON CODES

- 1 Holding Time/Sample Preservation
 - 2 Chromatographic pattern in sample does not match pattern of calibration standard.
 - 3 Compound Confirmation
 - 4 Tentatively Identified Compound (TIC) (associated with NJ only)
 - 5A Calibration (initial)
 - 5B Calibration (continuing)
 - 6 Field Blank Contamination
 - 7 Lab Blank Contamination (e.g., method blank, instrument, etc.)
 - 8 Matrix Spike(MS & MSD) Recoveries
 - 9 Precision (all replicates)
 - 10 Laboratory Control Sample Recoveries
 - 11 A more appropriate result is reported (associated with "R" and "DNR" only)
 - 12 Reference Material
 - 13 Surrogate Spike Recoveries (a.k.a., labeled compounds & recovery standards)
 - 14 Other (define in validation report)
 - 15 GFAA Post Digestion Spike Recoveries
 - 16 ICP Serial Dilution % Difference
 - 17 ICP Interference Check Standard Recovery
 - 18 Trip Blank Contamination
 - 19 Internal Standard Performance (e.g., area, retention time, recovery)
 - 20 Linear Range Exceeded
 - 21 Potential False Positives
 - 22 Elevated Detection Limit Due to Interference (i.e., laboratory, chemical and/or matrix)
-



EcoChem, INC.
Environmental Data Quality

APPENDIX B

QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
East Waterway
Fish and Crab Sampling

Sample ID	Laboratory ID	Method	Analyte	Result	Units	Lab Qualifiers	Validation Qualifiers	Validation Reason
EW08-MS-WB-SUPCOMP1_T4	K1003360-001	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW08-MS-WB-SUPCOMP1_T4	K1003360-001	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	8,10
EW08-MS-WB-SUPCOMP1_T4	K1003360-001	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW08-RRDC-EM-SUPCOMP3_T4	K1003360-006	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW08-RRDC-EM-SUPCOMP3_T4	K1003360-006	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW08-RRDC-EM-SUPCOMP3_T4	K1003360-006	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW08-RRDC-HP-SUPCOMP3_T4	K1003360-009	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW08-RRDC-HP-SUPCOMP3_T4	K1003360-009	EPA 1699M	4,4'-DDE	6.9	ug/kg		J	10
EW08-RRDC-HP-SUPCOMP3_T4	K1003360-009	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW08-RRDC-HP-SUPCOMP3_T4	K1003360-009	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW08-ES-WB-SUPCOMP2_T4	K1003360-011	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW08-ES-WB-SUPCOMP2_T4	K1003360-011	EPA 1699M	4,4'-DDE	9.3	ug/kg		J	10
EW08-ES-WB-SUPCOMP2_T4	K1003360-011	EPA 1699M	2,4'-DDD	0.83	ug/kg	J	J	10
EW08-ES-WB-SUPCOMP2_T4	K1003360-011	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW08-ES-WB-SUPCOMP2_T4	K1003360-011	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW08-ES-FL-SUPCOMP1_T4	K1003360-013	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW08-ES-FL-SUPCOMP1_T4	K1003360-013	EPA 1699M	4,4'-DDE	7.6	ug/kg		J	10
EW08-ES-FL-SUPCOMP1_T4	K1003360-013	EPA 1699M	2,4'-DDD	0.66	ug/kg	J	J	10
EW08-ES-FL-SUPCOMP1_T4	K1003360-013	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW08-ES-FL-SUPCOMP1_T4	K1003360-013	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW08-SS-WB-SUPCOMP1_T4	K1003360-016	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW08-SS-WB-SUPCOMP1_T4	K1003360-016	EPA 1699M	4,4'-DDE	7.1	ug/kg		J	10
EW08-SS-WB-SUPCOMP1_T4	K1003360-016	EPA 1699M	2,4'-DDD	0.52	ug/kg	J	J	10
EW08-SS-WB-SUPCOMP1_T4	K1003360-016	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW08-SS-WB-SUPCOMP1_T4	K1003360-016	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-S01-GD-Comp01	K1003360-025	EPA 1699M	beta-BHC	1.5	ug/kg		J	10
EW-S01-GD-Comp01	K1003360-025	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW-S01-GD-Comp01	K1003360-025	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-S01-GD-Comp01	K1003360-025	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-S01-GD-GB-Comp01_T4	K1003360-026	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW-S01-GD-GB-Comp01_T4	K1003360-026	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-S01-GD-GB-Comp01_T4	K1003360-026	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-08-SB004-BR-04_T4	K1003360-027	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW-08-SB004-BR-04_T4	K1003360-027	EPA 1699M	4,4'-DDE	10	ug/kg		J	10
EW-08-SB004-BR-04_T4	K1003360-027	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-08-SB004-BR-04_T4	K1003360-027	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-08-SB005-BR-05_T4	K1003360-028	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW-08-SB005-BR-05_T4	K1003360-028	EPA 1699M	4,4'-DDE	7.0	ug/kg		J	10
EW-08-SB005-BR-05_T4	K1003360-028	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-08-SB005-BR-05_T4	K1003360-028	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-08-SB006-BR-06_T4	K1003360-029	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW-08-SB006-BR-06_T4	K1003360-029	EPA 1699M	4,4'-DDE	8.4	ug/kg		J	10
EW-08-SB006-BR-06_T4	K1003360-029	EPA 1699M	Dieldrin	0.42	ug/kg	J	J	10
EW-08-SB006-BR-06_T4	K1003360-029	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-08-SB006-BR-06_T4	K1003360-029	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-08-SB007-BR-07_T4	K1003360-030	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW-08-SB007-BR-07_T4	K1003360-030	EPA 1699M	4,4'-DDE	17	ug/kg		J	10
EW-08-SB007-BR-07_T4	K1003360-030	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10

Qualified Data Summary Table
East Waterway
Fish and Crab Sampling

Sample ID	Laboratory ID	Method	Analyte	Result	Units	Lab Qualifiers	Validation Qualifiers	Validation Reason
EW-08-SB007-BR-07_T4	K1003360-030	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-08-SB008-BR-08_T4	K1003360-031	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW-08-SB008-BR-08_T4	K1003360-031	EPA 1699M	4,4'-DDE	49	ug/kg	E	J	10
EW-08-SB008-BR-08_T4	K1003360-031	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-08-SB008-BR-08_T4	K1003360-031	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-08-SB009-BR-09_T4	K1003360-032	EPA 1699M	delta-BHC		ug/kg	U	R	10
EW-08-SB009-BR-09_T4	K1003360-032	EPA 1699M	4,4'-DDE	11	ug/kg		J	10
EW-08-SB009-BR-09_T4	K1003360-032	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-08-SB009-BR-09_T4	K1003360-032	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-08-SB012-BR-10_T4	K1003360-033	EPA 1699M	delta-BHC		ug/kg	U	UJ	10
EW-08-SB012-BR-10_T4	K1003360-033	EPA 1699M	Hexachlorobenzene	1.2	ug/kg	J	J	10
EW-08-SB012-BR-10_T4	K1003360-033	EPA 1699M	4,4'-DDE	21	ug/kg		J	10
EW-08-SB012-BR-10_T4	K1003360-033	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-08-SB012-BR-10_T4	K1003360-033	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-08-SB011-BR-11_T4	K1003360-034	EPA 1699M	delta-BHC		ug/kg	U	UJ	10
EW-08-SB011-BR-11_T4	K1003360-034	EPA 1699M	Hexachlorobenzene	0.96	ug/kg	J	J	10
EW-08-SB011-BR-11_T4	K1003360-034	EPA 1699M	4,4'-DDE	30	ug/kg		J	10
EW-08-SB011-BR-11_T4	K1003360-034	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-08-SB011-BR-11_T4	K1003360-034	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-08-SB013-BR-13_T4	K1003360-035	EPA 1699M	delta-BHC		ug/kg	U	UJ	10
EW-08-SB013-BR-13_T4	K1003360-035	EPA 1699M	Hexachlorobenzene	1.7	ug/kg	J	J	10
EW-08-SB013-BR-13_T4	K1003360-035	EPA 1699M	4,4'-DDE	16	ug/kg		J	10
EW-08-SB013-BR-13_T4	K1003360-035	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-08-SB013-BR-13_T4	K1003360-035	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-B06-BC-01-COMP2_T4	K1003360-036	EPA 1699M	delta-BHC		ug/kg	U	UJ	10
EW-B06-BC-01-COMP2_T4	K1003360-036	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-B06-BC-01-COMP2_T4	K1003360-036	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-B03-BC-03-COMP1_T4	K1003360-037	EPA 1699M	delta-BHC		ug/kg	U	UJ	10
EW-B03-BC-03-COMP1_T4	K1003360-037	EPA 1699M	Hexachlorobenzene	0.77	ug/kg	J	J	10
EW-B03-BC-03-COMP1_T4	K1003360-037	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-B03-BC-03-COMP1_T4	K1003360-037	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-B08-BC-01-COMP2_T4	K1003360-038	EPA 1699M	delta-BHC		ug/kg	U	UJ	10
EW-B08-BC-01-COMP2_T4	K1003360-038	EPA 1699M	Hexachlorobenzene	0.77	ug/kg	J	J	10
EW-B08-BC-01-COMP2_T4	K1003360-038	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-B08-BC-01-COMP2_T4	K1003360-038	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-B08-CN-02-COMP1_T4	K1003360-039	EPA 1699M	delta-BHC		ug/kg	U	UJ	10
EW-B08-CN-02-COMP1_T4	K1003360-039	EPA 1699M	Hexachlorobenzene	1.4	ug/kg	J	J	10
EW-B08-CN-02-COMP1_T4	K1003360-039	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-B08-CN-02-COMP1_T4	K1003360-039	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-B09-MY-M-COMP1_T4	K1003360-040	EPA 1699M	delta-BHC		ug/kg	U	UJ	10
EW-B09-MY-M-COMP1_T4	K1003360-040	EPA 1699M	Hexachlorobenzene	1.5	ug/kg	J	J	10
EW-B09-MY-M-COMP1_T4	K1003360-040	EPA 1699M	Oxychlordane		ug/kg	U	R	8
EW-B09-MY-M-COMP1_T4	K1003360-040	EPA 1699M	Endosulfan I		ug/kg	U	R	8
EW-B09-MY-M-COMP1_T4	K1003360-040	EPA 1699M	Endrin Aldehyde		ug/kg	U	R	8
EW-B09-MY-M-COMP1_T4	K1003360-040	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10
EW-B10-BC-01-COMP2_T4	K1003360-041	EPA 1699M	delta-BHC		ug/kg	U	UJ	10
EW-B10-BC-01-COMP2_T4	K1003360-041	EPA 1699M	Endrin Aldehyde		ug/kg	U	UJ	10
EW-B10-BC-01-COMP2_T4	K1003360-041	EPA 1699M	Endosulfan Sulfate		ug/kg	U	UJ	10